A REPORT

ON

VOCATIONAL TRAINING IN CHICAGO

AND IN OTHER CITIES

An analysis of the need for industrial and commercial training in Chicago, and a study of present provisions therefor in comparison with such provisions in twenty-nine other cities, together with recommendations as to the best form in which such training may be given in the public school system of Chicago

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BY

A SUB-COMMITTEE

OF THE

COMMITTEE ON PUBLIC EDUCATION, 1910-1911

OF THE

CITY CLUB OF CHICAGO

Ernest A. Wreidt
William J. Bogan
George H. Mead, Chairman
Sub-Committee

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City Club of Chicago.

Chicago, February 23, 1912.

To the Board of Directors of the City Club of Chicago:

Gentlemen,— The subjoined report has been in process of growth since the latter part of 1909. The committee of the club on Public Education for 1909-10 presented to the directors of the club, in November, 1909, a plan for the study of the needs for industrial and commercial training in Chicago, of the actual training which is given there, and especially of the industrial and commercial training which is given elsewhere in the country. The plan was presented by the board to Mrs. Emmons Blaine, whose generosity made it possible to meet the expenses of the investigation. Mr. Ernest A. Wreidt undertook for the committee a detailed study of the problem of industrial training in Chicago and elsewhere in the country. The committee secured the services for a few months of Mr. Walter C. Campbell to study the problem of commercial training in Chicago, and the commercial schools and courses in Boston, Cleveland and St. Louis. At the suggestion of the committee, Mr. Irving M. Ristine made an intensive study of the results of the schooling of a number of boys engaged in Chicago's industries, who had left school at different grades from the fifth up. These three gentlemen were engaged in research in education in the graduate school of the University of Chicago, and at certain points were given advice and suggestions by members of the faculty of the Department of Education of the University, for which we wish to express our great appreciation.

When this material had been gathered it was turned over by the club Committee on Public Education for 1910-11 to a sub-committee consisting of Mr. Wreidt, who had in the meantime become a member of the Committee on Public Education, Mr. William J. Bogan, principal of the Lane Technical High School, and Mr. George H. Mead, the chairman of the committee. This sub-committee has been occupied up to the present time in formulating its recommendations and in putting the material in form for submission to your body. These recommendations were presented in outline by the sub-committee to the Committee on Public Education in June, 1911, and were approved by that committee. Beyond this the responsibility

for the report rests upon the sub-committee. The report has not been considered by the committee of the club on Public Education for 1911-12.

We desire in presenting this report to express our own great appreciation of Mrs. Emmons Blaine's intelligent interest and generosity, also our appreciation of the cordial coöperation of the Chicago Association of Commerce with the sub-committee in investigating the conditions and needs of industrial training in Chicago. The Education Committee of that association recommended such coöperation to the Executive Committee of that body, and that committee gave the sub-committee assistance of the most valuable kind, furnishing letters signed by their president, the chairman of the Executive Committee and the general secretary, to all the chairmen of their subdivisions, thus facilitating approach to the different houses and manufacturing establishments in Chicago. We wish to express our great appreciation of the ready coöperation of the Committee on Schools of the Chicago Federation of Labor, who turned over to us the replies made by the unions comprised in the Federation of Labor, to the questionnaire which is quoted in our report. We desire, finally, to express our great appreciation of the frequent assistance given us by Mrs. Young, Superintendent of Education in Chicago, and by others in the office of the Superintendent of Education.

With this preface, we respectfully present to you the following report on Vocational Training in Chicago and in other cities.

Ernest A. Wreidt,
William J. Bogan,
George H. Mead, chairman,
Sub-committee.

March 12, 1912.

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REPORT ON VOCATIONAL TRAINING

PART I
INTRODUCTION

CHAPTER I
GENERAL SUMMARY AND RECOMMENDATIONS

A. GENERAL SUMMARY

By
GEORGE H. MEAD
Chairman of the Sub-committee

In Chicago, as in other cities in America, only a little over one-half of the children complete the elementary course. Forty-three per cent of those who enter the first grade do not reach the eighth grade at all, and 49 per cent do not complete the eighth grade [p. 29 ff]. Under what the school considers normal conditions children enter the first grade at the age of seven, the second at the age of eight, third at nine, fourth at ten, fifth at eleven, sixth at twelve, seventh at thirteen, and the eighth at fourteen. The State laws keep children in school up to the age of fourteen. Thus the normal child may not leave school until he has completed the eight grades of the elementary school. We find expressed in the age of entrance coupled with yearly promotions, and in the State compulsory education law, the judgment of educators and legislators that the normal child should complete the eight elementary grades before he leaves school. The school curriculum implies as much. By the end of the sixth grade children have become acquainted with the principal operations in arithmetic, and have been trained in the simple use of English. During the seventh and eighth grades they are trained in the application of these principles of number and language and gain some hold upon American History, some knowledge of the city in which they live, besides a little elementary science. It has been generally maintained that unless the child completes this entire course he is unable to retain what he has acquired. Our investigator's report [p. 272 ff]

is decisive upon this for the boys whom he was able to examine. These boys had dropped out of school at all grades from the fifth up. A number were twenty years old and more. Still a simple fifth grade examination in arithmetic and English revealed the fact that those who had left school before completing the eighth grade had lost most that they had learned in school, though the study of their papers showed that those who remained longer retained relatively more. Every added year in school meant a little more hold upon what had been once learned, but the whole elementary period was necessary to make even the work of earlier grades a permanent acquisition.

In this study we have then evidence given by Chicago boys, who left school to go to work between the ages of fourteen and sixteen before completing the elementary school. This evidence from our own children confirms the accepted judgment of legislators and educators that our schools can not give the minimum education for American citizenship in less than the eight grades. It is this conclusion that gives serious meaning to elimination statistics. If 43 per cent of our children never reach the eighth grade and 49 per cent never complete it, we must confess that nearly half our children fail to get the minimum education contemplated by our laws, and to a great degree, fail to hold on to what they do get in the schools, and that thus our school system operates at a serious disadvantage, since a large part of its training of intelligence is inevitably lost. Consider these figures from the standpoint of efficiency of operation: of the 43 per cent of our school children who never reach the eighth grade, a fourth, or 11 per cent of all the children in the schools, do not reach even the sixth grade; nearly one-third of these 43 per cent, or 16 per cent of all, drop out in the sixth, and another third in the seventh grade [p. 29 ff]. Just because we recognize the solidarity and articulation of our elementary school, we must recognize that these figures measure unquestioned waste in operation of the public school. They measure not alone the loss of what the children might have learned had they remained in school, but the loss even of a great part of what they have learned; in a word, the loss of that organic whole — an elementary school training. This conclusion brings us face to face with the statistics of "retardation" or more correctly "over-age" in the elementary school. Any child who enters the first grade after his eighth birthday or who is not promoted a grade each year is termed a retarded

child. The term is ambiguous. Its implication in the minds of many is apt to be backwardness in intelligence or defect in character. This implication is not justified by the fact of late entrance nor always by failure in promotion. Many over-hasty generalizations have been drawn from retardation statistics. One conclusion is, however, beyond cavil. Any child who enters a year late or repeats a year — i. e. any over-age child — is free to leave school before he has completed the elementary curriculum. The principal purpose of the compulsory education statute is thwarted by over-age or retardation in our elementary schools. There are approximately 70,000 retarded children in the Chicago elementary schools — or one-third of all the school children [p. 31]. There are nearly 15 per cent over-age children in the first grade and the percentage increases steadily in the succeeding grades up to nearly 47 per cent in the fifth grade. It then falls off uniformly up to the end of the eighth grade. The explanation of the drop in the curve of retardation is that large numbers of over-age children in the fifth and sixth grades have reached the age of fourteen, have obtained the age and school certificates, and have left school with no fear of the truant officer. Retardation makes for elimination and elimination spells defective education.

Measures which reduce retardation or over-age in the elementary schools must reduce elimination and must therefore bring the schools nearer to the goal of giving an effective common school education to all the children in the city. Certain recommendations made in this report have this reduction of the over-age percentage in the schools directly in view [p. 21]. On the other hand we can not expect to meet the loss involved in elimination by reducing the over-age percentage to zero. An inference, that can be safely drawn from the over-age of a third of the whole number of elementary school children, is that the two periods, the fourteen-year compulsory education period, and the eight-grade period, do not actually correspond. The curriculum of the elementary school can not be covered in eight grades by a large proportion of our children. If, then, they are to complete their elementary schooling they must do this after they have passed the age of fourteen and out of the jurisdiction of the truant officer.

In a very real sense a boy or girl, especially a boy, over fourteen years of age does not fit into our elementary school curriculum as that curriculum is at present constructed, even with its manual

training and household arts. No better evidence for this can be offered than the large numbers who leave school as soon as the fourteen years compulsory period is passed. This evidence comes of course not from Chicago alone. The investigations in Massachusetts[1] and St. Louis[1] as well as in other communities, have revealed the same large percentage who leave school as soon as the fourteen-year period is reached. These investigations have shown conclusively that the prevailing reason for leaving school is not to be found in the financial need of the family of the fourteen-year old child. The child's own lack of interest in the school as well as that of his parents is the unquestioned reason for the largest part of the elimination in our elementary schools. Other investigations have been so conclusive on this point that this committee has not felt that we needed to undertake a special study of the motives of Chicago children for dropping out of school as soon as the law permits, or those of their parents in allowing this elimination.

Our elementary school curriculum undertakes more than can be accomplished by a large percentage of the children during the period of eight school years. The over-age of one-third of the children is convincing evidence that they can not complete this curriculum inside of the time during which the law keeps them in school; and neither the interest of the child nor that of his parents keeps him there when the law has withdrawn its hand.

It would be possible to meet this situation by restricting the curriculum, and increasing the school time. A curriculum shorter than that of the American elementary schools, and longer school sessions, are found in the elementary schools of Berlin, Germany. Still retardation and elimination seem to be as high there[2] as in Chicago, and the situation in the Berlin schools is typical of that in the Ger-

[1] We have not overlooked the fact that Chicago's laboring class is predominately unskilled and consequently lives on the lowest wages, and that the family's demand for children's wages in certain localities of Chicago is much greater than it probably is in Massachusetts or in St. Louis. But even after taking these facts into account, we are convinced, in the first place, that the economic motive is not the determining motive of children who drop out of the elementary schools, and in the second place, that no community can afford to recognize an economic situation, in which families must depend upon the earnings of children in the period between fourteen and sixteen, as so legitimate, that this situation should determine its educational policy. No community can afford to permit the interests of child labor to interfere with or cut short the education it can give its children.

[2] See "The Results of Two Examinations of German Pupils," quoted in the report of the Commissioner of Education, 1907, Vol I, p. 175 ff., and a discussion upon these examinations in the German Reichstag, quoted in the report of the Commissioner of Education, 1909, Vol. I, p. 461 ff. For retardation and elimination, see *Organisation und Unterrichtserfolge der Stäatischen Volksschulen in Deutschland,* Emil Schwartz, 1907, Berlin, p. 97 ff.

man schools elsewhere. This is instructive, because the German *Volkschule* — or people's school — is in session some fifteen hundred hours during the year, while the yearly session of the American elementary school is only about a thousand hours. Furthermore, there is no manual training nor, excepting needlework for the girls taken generally during the boy's gymnastic period, are there household arts in the curriculum of the German *Volkschule,* to which the American elementary school gives from two to three hours a week. Germany seeks to meet the incompleteness of her common school education by continuation classes for the boys who go from school to work. These continuation classes occupy only from five to ten hours a week, but they continue until the boy has reached the age of eighteen. It is probable that the number of children who drop out from the fifth grade and below in the German *Volkschule* is smaller than the corresponding number from the American school systems. It is also probable that the permanent acquirements of the eliminated children are greater than in the case of the American eliminated child. Still, with greater rigor of administration, longer school sessions, and a more restricted curriculum Germany has not completely solved this problem. For, the administration of the continuation school, the German manufacturers and merchants raise the same complaints against the unsatisfactory character of the common school education of the German child which we hear in Chicago and elsewhere in America; though the comparison of the results of the German examinations[2] with those presented in Part IV of this report indicates that the German complaints are by no means so fully justified as are those which have been made in Chicago.

In the opinion of your committee, a discussion of the question of reducing the content of the curriculum of the American school or of increasing the school time while the content of the curriculum remains the same would have only academic interest. The influences which have forced continually new material into that curriculum are fundamental influences in our schools and in the community at large. They are as American as are our public schools. There is no reason to believe that the elementary school curriculum will be cut down and school time increased to such an extent that over-age will disappear and thus automatically eliminate elimination. Nor would it be reasonable to simply adopt the other half of the German program and to try to meet the ineffective education which follows upon elimination by continuation classes. Continuation classes will carry on

the use of number and language when a minimum requirement has been reached. They will not supply the minimum requirement. The text books of German shop arithmetics contain simply problems in number work, taken from the trade in which the boy has been apprenticed. Their training in the mother tongue is continued by the writing of letters appropriate to the boy's trade and the use of German in making reports and estimates. In certain of the German continuation schools, notably those of Munich, some richer material than that just mentioned is introduced into the curriculum. In general, however, the work is neither fundamental enough to take the place of continuous schoolwork nor is the course rich enough in other subjects to provide the training which we have come to believe is essential to an American education. Continuation classes would not replace the training which only a little more than half of the pupils in our elementary schools are able to secure. If the child reaches the fifth, sixth or seventh grade at the age of fourteen other motives must be brought to bear upon him and his parents if he is to be kept in school.

Again, it is the generally accepted judgment of educators that the boy and girl in the neighborhood of fourteen are so much interested in the society into which they expect to enter and the occupations of men and women in that society, that a school which does not appeal to the vocational motive is bound to lose the interest of a great number of these children. It is of course possible that the home atmosphere may be so favorable to continuation in school, and the parents may so influence their children that they will continue to follow even an academic course of study, after they have reached the turning point of the adolescent period. But most of the parents and homes of the eliminated children are not interested in the continuation of the children in school. Very many accept the compulsory school period as the educational standard of the community. This is not the only instance in which a permissive attitude of the law tends to become a community standard. It is also true that the majority of the parents of these children are mainly interested in their children's occupations. The parents are as much subject to the vocational motive as are their children.

We are therefore confronted by this situation: an elementary school curriculum which only a half of our children follow to its conclusion, and yet the curriculum is such that those who drop out only imperfectly acquire what they have studied.

The retardation or over-age of our school children takes them beyond the age of compulsory school attendance, and children at this age, as well as the parents, are predominately interested in the jobs they can secure; that is, they are interested in their vocations however narrow their views of their vocations may be.

The recommendation [p. 15] of your committee is that industrial, i. e., vocational work[3] should be introduced into the seventh and eighth grades of the elementary school.

We do not believe that the curriculum should be impoverished for a class of children who wish to go to work when they leave school. We heartily recommend [p. 24] continuation classes for those who have gone to work, but we do not believe that these classes can replace what the child loses by leaving the school before he has completed the whole elementary course.

The first part of our recommendation is, therefore, a plan, worked out in some detail, of a type of school in which half of the time in the seventh and eighth grades may be given to vocational work, while during the other half of the school time we are confident that as much can be accomplished in the academic studies as is accomplished to-day. We recommend for these vocational grades a school day of six hours instead of the present five hours and a rearrangement of the time given to different subjects. From a study of vocational schools elsewhere in America, notably in Rochester [p. 170], Albany [p. 173], and New York City [p. 179], New York, in Fitchburg [p. 164], Newton [p. 177], and Boston [p. 166], Massachusetts, and in Menominee [p. 162], Wisconsin, we have convinced ourselves that vocational work, which is worth the while, can be done in the seventh and eighth grades by children who have reached the age of thirteen. The work done in these schools is not of a manual training character. It consists in actual trade processes and produces articles which have commercial value. The courses do not attempt in the nature of the case to make mechanics or artisans of the children. The training is of a preparatory trade character. It will unquestionably assist the child in his later trade training. It will also help him to select the trade for which he is

[3] Vocational work is done as far as possible under the conditions of the occupation outside the school. Its products, so far as possible, are commercial products, and its processes commercial or trade processes. Vocational work in the elementary school can not be trade training in the accepted use of this term, because the children have not yet reached sufficient maturity for the trade school. Vocational work in the elementary school is preparatory trade training, and as such is different in principle from manual training [p. 28].

adapted. It is our belief that it will hold the child in school who at present finds nothing there that interests him, and will quicken the interest of his parents in his further training. It will hold him in school so that he can permanently acquire what the elementary school should give to every American child, and what it can not give him if he drops out before he has completed all of the grades.

We recognize that such an innovation must be worked out carefully and with selected teachers. We recommend therefore the establishment of not more than three of these schools at first, and lay stress upon the need of well-equipped shops and enthusiastic teachers for these experimental stations. Such schools could pass on its pupils to either the academic or technical high school [p. 19], but it is evident that there should be also trade schools for boys who have reached the age of sixteen. Such schools, similar to the trade schools in the Milwaukee school system, should be established within two years at least after these vocational schools have been instituted [p. 23].

In the meantime there are children below the seventh grade who have reached the age of twelve and thirteen and who need the appeal of the vocational motive. For these children rooms or schools — one perhaps for each of the three sides of the city — should be established [p. 21]. We have one that approaches what we recommend in the Farragut school in Chicago [p. 104]. The school for retarded children in Cleveland [p. 168] shows what such training can accomplish. We insist, however, that children in such rooms must have a very large degree of individual attention, and that the aim of the training should be to return them to the grades so that they may complete their elementary school training.

We have recommended changes in our technical high schools which will increase their capacity by one-third [p. 25], which will enable them to give a more advanced form of trade training as well as that which leads up to the technical colleges [p. 25]. We have recommended the introduction of technical training for girls [p. 27] into the boys' technical high schools such as is being undertaken in the Lucy Flower Technical High School for girls.

In the plan which has been outlined, the over-age pupil will be met by vocational work and individual attention below the seventh grade in the schools or rooms for retarded pupils. If the over-age boy or girl has reached the seventh grade he can enter one of the vocational schools, where he will find preparatory trade training that

will appeal directly to his interest in the work of the outside world and yet he will complete his seventh and eighth grade. When he has completed these, the system will open to him the doors either of the academic high school, the technical high school, or the trade school, for this boy will by this time probably have reached the age of sixteen. If he has graduated from the elementary school at the age of fourteen or fifteen, before he can profitably enter the trade school proper, and yet wishes to prepare for the trade school, we have recommended [p. 26] that he be provided with elementary trade training in the first and possible second year of the technical high school.

Our great contention is that vocational training be introduced into our school system as an essential part of its education — in no illiberal sense and with no intention of separating out a class of workingmen's children who are to receive trade training at the expense of academic training. We are convinced by what we have found elsewhere in America, as well as in other countries, that such a division is unnecessary. We are convinced that just as liberal a training can be given in the vocational school as that given in the present academic school. Indeed, we feel that the vocational training will be more liberal if its full educational possibilities are worked out.

We have attempted to indicate in detail how the vocational motive may be introduced, basing our suggestions upon actual experiences and results. We have attempted to find a place for the vocational motive at the points at which the actual condition in the Chicago schools shows the need, and we have indicated how such vocational training introduced into the elementary school can be carried on in the secondary period.

Finally we have taken into account the economic loss to children and their parents if they remain in school after the age of fourteen and are thus deprived of the opportunity of earning. We find that the boys who leave school to go to work between the ages of fourteen and sixteen are idle half of the time, and earn during these two years not more than an average of $2 a week [pp. 34, 37]. We find that they are not needed in the industries of Chicago [p. 35] and that the return which they bring in to their homes is negligible. We find further [p. 46], that which all students of children out of school during these years have found, that they gain no training that is of value for them in later years. On the contrary their idle-

ness during at least half the time, their frequent passing from one job to another, their lack of any responsibility, necessarily leads to moral, mental, and frequently physical degeneration. During two of the most valuable years for preparation for life they are going backward instead of forward.

On the other hand we find that Chicago industries are in need of trained operatives and mechanics, which Chicago does not provide [p. 42 ff]. From nearly all industries comes the demand for more skilled and responsible workmen. From the trade unions comes the demand for vocational and trade training for their children, if it can be given within the public school system [p. 74 ff].

In the meantime the part-time training in school and shop, such as that already in operation in Lewis Institute [p. 137] should be pushed as far and as rapidly as possible, and we must make use of the other types of continuation schools which have been so valuable to Germany's industries [p. 24], though it would be most short-sighted to expect to accomplish what we must accomplish with the continuation school alone.

We have recommended the introduction of commercial courses as vocational courses in the elementary schools in the seventh and eighth grades [p. 21], and following upon the example of Boston and Cleveland we have recommended the establishment of a commercial high school [p. 27]. Such commercial high schools bear the same relationship to the preparation for commercial occupations that the technical high schools and trade schools bear to the mechanical occupations. The striking and admirable results attained in Boston and Cleveland leave no doubt, in the minds of those who have studied them, of their value both to the community and to the school system [p. 245 ff]. We have recommended further that the commercial training which must still be given in other high schools should be brought more closely under the control of commercial standards and processes than it is to-day [p. 27]. There is evidence of the unsatisfactory commercial training given in our private commercial colleges and the vast sums which are paid for it by Chicago every year [p. 258 ff. and p. 256].

We find finally that an adequate school system such as we have endeavored to outline will leave no justification for the absence from school of our children between the ages of fourteen and sixteen. The children lose morally, mentally and physically by this premature entrance into industry. The industries have no legitimate need

for them. They bring in an insignificant return to their parents and they have gained no training for later occupations. We recommend therefore that when Chicago has introduced into her school system vocational training appropriate to the fourteen to sixteen year period, she should demand compulsory attendance upon school between the ages of seven and sixteen [p. 25], though we have called attention to the Ohio law which more modestly requires that the children must attend continuation classes during the fourteen to sixteen year period, leaving, however, this requirement to the option of the communities [p. 130].

While we have felt that we should make our recommendations as detailed as possible, we have undertaken to suggest nothing that involves revolutionary procedure. We have asked for experimental stations where the method of introducing vocational training into the schools can be worked out carefully under the most favorable conditions.

In conclusion we again insist that vocational and trade training must appear in the American public school as an essential part of that unique institution. Nothing of the meaning of our own public school system must be lost, nor can we hope to solve this complex and difficult problem by simply copying methods from other communities, not even those of Germany. We make these recommendations with more confidence because they seem to us to be in harmony with the present policy of the Board of Education of Chicago, and of its Superintendent of Schools, Mrs. Ella Flagg Young. Evidence for this is found in the installation of the Lucy Flower Technical High School for girls; the enlarged and improved course of study for the Apprentice Schools; the increase of vocational work in the technical high schools for boys, and the encouragement of part time work in the last year of these courses; the increase of vocational work in the night schools; the two-year vocational courses offered in all the high schools; the industrial course for retarded children in the Farragut school; and the plan printed in the last "Course of Study" for industrial courses in the sixth, seventh and eighth grades. The movement in the school system itself is toward vocational work. We have endeavored to indicate where and how vocational work should in our opinion appear as a constituent part of the curriculum, providing not only a considerable portion of its content, but also a method of training and a point of view from which to interpret life.

B. RECOMMENDATIONS

By

The Sub-committee

In the recommendations which follow, the attempt is made to present a fairly complete outline of provisions which should be made in the public schools to meet in an initial way the need for vocational training in the city. The various types of courses recommended are intended to meet this need not only for pupils who continue in school for the full twelve grades, but also for those who are likely to leave school at various points before completing the course.

Individuals may be classified into the following five groups with respect to their need for vocational courses in the schools:

(1) Those who leave school in various grades below the high school;

(2) Those who enter the high school but do not finish the course;

(3) Those who complete the high school course but do not enter college;

(4) Those who finish the high school and enter college;

(5) Those who are already at work in the industries.

It is especially important to provide for those who leave school at fourteen years of age (mainly in group (1), above) by giving them the opportunity to take vocational courses one or two years before reaching that age, no matter what grade they are in. The schools of types 1, 2, and 3, below, are intended for such pupils, type 2 primarily for over-age pupils. By appealing in this way to the vocational motive of pupils *before* they are old enough to leave school it is hoped that they may be aroused to an appreciation of the value of further school training after the compulsory attendance period. These schools may help materially in retaining pupils in school at the point where the greatest and most serious elimination now occurs. Such schools can also do much to help solve the problem of a suitable training for the unskilled worker, for they will take the pupil before he enters the industries and should give him a preliminary training in skill which will serve as capital for his future work, and they should develop a degree of industrial intelligence and adaptability which will enable the worker to rise from unskilled or only slightly skilled occupations to positions requiring skill and intelligence.

Pupils below the high school (group (1) above) who are sixteen years of age (or fourteen years, for girls) may enter the trade schools proper (types 4 and 5, below), provided they have completed grade six. For the boy who completes grade eight at fourteen or fifteen years of age, and who wants to enter the trade school, provision is made by offering special work in the first year or two of the technical high school (see type 10 below) preparatory to the work in the trade school.

For pupils who take a complete high-school course, but who do not enter college (group (3) above), provision is made in the recommendation for a four-year and for a six-year finishing course, with specialization in the latter part of the course, preparing definitely for vocations (type 10, below). A suitable degree of flexibility in this course, together with the two-year vocational courses now offered, will provide also for those high-school pupils who leave school before finishing the course (group (2), above).

For pupils of group (4), those who go on through high school and into college, provision has long been made in the regular course of study. Additional provision has recently been made in the two-year college technical course.

For persons already at work in the industries (group (5), above) provision is made in the recommendation for continuation schools (items 6, 7, and 8, below).

The diagram facing page 14 shows in schematic form the articulation of the proposed schools and courses with present schools.

For the schools recommended in 1, 2, 3, 4, 5, and 13, below, it is strongly urged that a separate or independent organization be provided, with a principal and staff of teachers specially fitted for, and giving their attention exclusively to, this work. This is necessary in order to give these schools the distinctive aim and purpose which they should have, and it is of very great importance in the present experimental stage of vocational training, when a content and a method for these courses are still to be developed. Not all teachers have the special training and ability needed for this pioneer work; not all are yet in full sympathy with vocational training. This lack of sympathy on the part of many teachers and principals is well brought out in a recent report of the Superintendent of Chicago Schools[3], and should emphasize the importance of the independent organization here recommended. It is of the utmost importance

[3] June 30, 1911, p. 7.

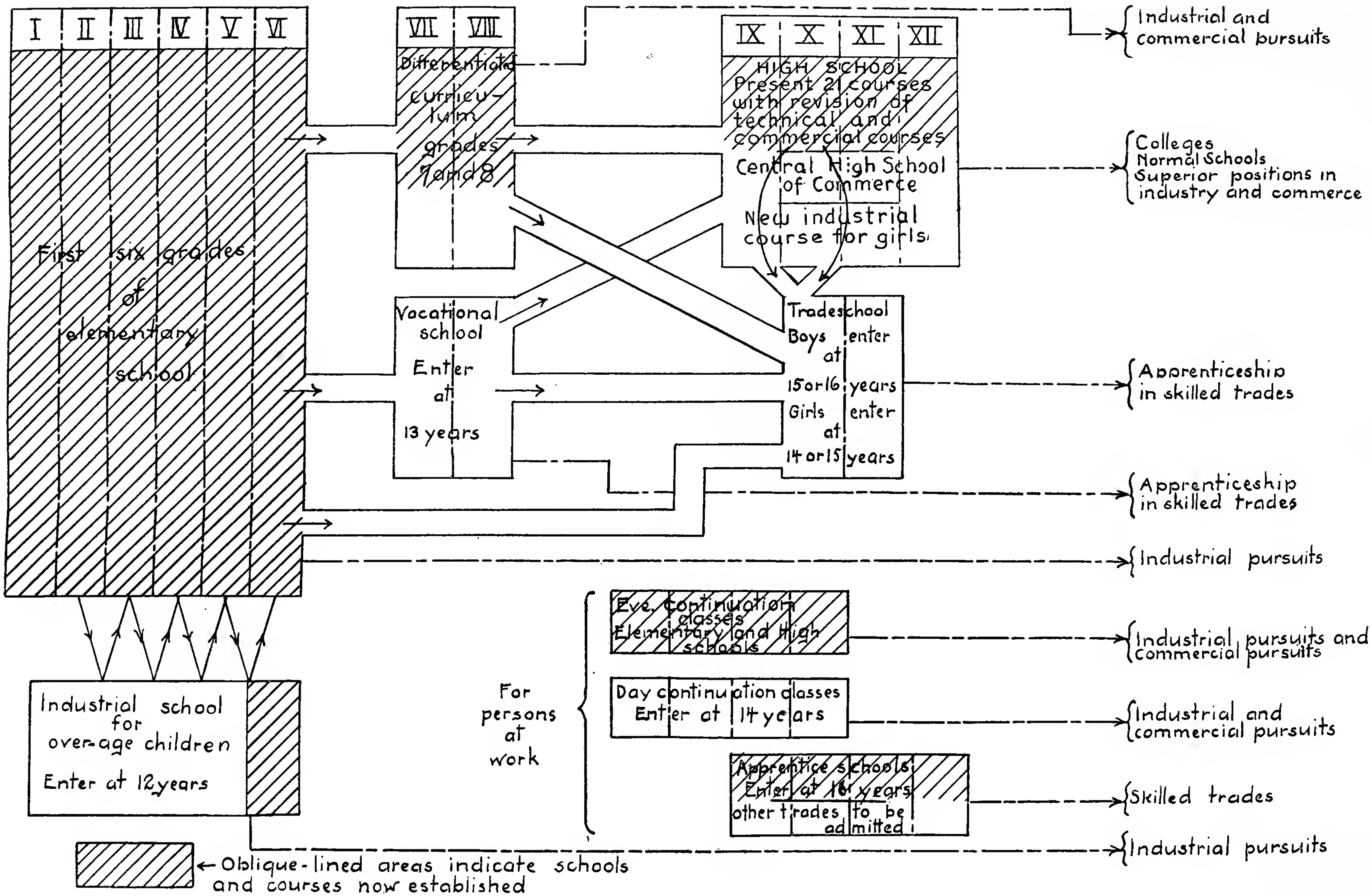
that vocational courses should preserve their integrity, that they should be really vocational if they pretend to be. The independent organization, established in certain centers of the city, and having a select staff of teachers, could render valuable service in working out a content and method for similar courses to be established later, or simultaneously, in the regular schools in other parts of the city. When vocational training is once thoroughly established, with a definite content and method, it should not be impossible to weld together the various parts of the school system so as to preserve a proper social balance.

The shopwork in the industrial courses recommended should have the character of actual trade work, approximating as closely as possible the best conditions prevailing in the industries themselves. This may be done, as it is at present done in many industrial schools[4], by the making of equipment, apparatus and other articles of a distinctly commercial standard actually needed and put to use in the schools or elsewhere. Shopwork of this character, as over against the more or less dilettante and abstract work of the usual manual training course, gives a definite vocational trend to the industrial courses and thus presents added stimuli to work on the part of the pupils.

The so-called Chicago course at present given in the eighth grade is an example of the richer and more educative kind of academic subject matter which can be introduced not only into the eighth but also into the seventh grade in our schools. The children, by the time they have reached the seventh grade, are able to appreciate in some degree the relation of what they are learning to the life and occupations of the community. This is an opportunity of which the fullest use should be made not only for intellectual, but also for moral education. Vocational training has the great advantage of presenting points of contact between the studies and occupations in the school and the life of the community. By using these the mathematics and elementary science on the one hand and the geography and history on the other can be lifted out of mere text-book studies and become interpretations of the activities and social life of the community. It is the opinion of the committee therefore that while some time can be saved by bringing science and mathematics together, and history and geography together, the curriculum of the vocational courses can give a more thorough intellectual and moral training than the

[4] See p. 161 ff.

-DIAGRAM SHOWING ARTICULATION OF PROPOSED SCHOOLS AND COURSES WITH EXISTING SCHOOLS AND WITH OCCUPATIONS-



curricula of courses which lack this immediate connection with the life of the city.

As a result of its study of conditions in Chicago and in twenty-seven other cities, the committee respectfully recommends that the following provisions be made for vocational training in the public schools of the city.

1. Two-year Elementary Vocational Schools

Establish a two-year vocational school admitting boys and girls at thirteen years of age who have had the equivalent of a six-grade training. At least half of the time should be devoted to handwork, including drawing, in the elementary phases of some of the trades listed below. The remaining time should be devoted to academic subjects intimately related to the work of the trades. The school day should be at least six hours (60 minutes each).

Graduates of this school should be admitted to the trade schools proper (4 and 5, below) and to all courses in the high school.

Pupils with an academic status below that of the sixth grade should also be admitted to this school for special work, at the discretion of the principal. Such special students would not ordinarily be eligible for admission to high-school courses after two years in the vocational school.

The trades furnishing appropriate shop work for the vocational school may be classified in the following groups:

For Boys

1. Building trades
   Carpentry, plumbing, steam and gas fitting, sheet metal, electrical construction, bricklaying, tile setting, concrete work, painting (house, sign, and fresco), paper hanging, architectural drafting
2. Machine trades
   Pattern making, foundry work, forge work, bench and vise work, machine practice, machine drafting
3. Furniture trades
   Cabinet making, finishing, upholstering
4. Printing trades
   Typesetting, bookbinding, engraving, lithography
5. General wood and metal work
   Joinery, turning, cabinet making, pattern making, foundry work, forge work, bench and vise work, machine practice

For Girls

6. Bookbinding, engraving, photography, dressmaking, millinery, garment making, embroidery, laundering, cooking, institutional and lunch-room management

    Homemaking: cooking, sewing, house sanitation and management, dietetics, care of infants and invalids, house decorating and fitting, household accounts

Specialization in a particular trade for the entire two years should not be permitted. All pupils should be required to work in several related trades in one or more of the above trade groups. Group 5 is intended especially for boys who have not decided upon the particular trade they wish ultimately to follow. Since girls must be prepared for their function of homemakers as well as for work in a particular trade, it is important that all girls be required to take work in homemaking in addition to the trade work selected.

In order to maintain a proper standard of shopwork, and to approximate as closely as possible the best conditions in actual trade work, the products made in the shop should, whenever possible, be those which are actually needed and put to use in the schools or elsewhere. The kind of work here referred to is shown by the following lists of products made in certain industrial schools by students of essentially the same stage of advancement as those for whom the vocational school is intended.

Wood-working

Work benches, looms, and saw-horses constructed. Assisted in making kitchen tables. Making teachers' desks for entire building. Building partitions and 300 lockers [p. 165][5]

25 large drawing boards	12 umbrella racks
100 primary looms	50 book cases, 2 designs, at $10
25 pillow looms, with heddles	120 desk chairs
100 drawing kits	20 sanitary teachers' desks
25 sawhorses	12 music cabinets
50 sewing boxes	[p. 172]
36 manual training benches	

Three houses were built, in miniature. The smallest, three feet by five feet, is a two-story braced frame with no inside partitions. The middle house, six by eight, is a two-story balloon frame, with staircase and closet on the first floor. The largest, eight feet by fifteen feet, is a three-room bungalow, with full head room, with a chimney and fireplace put up by the bricklaying class, and with plumbing fixtures for the kitchen

[5] The page citations refer to the descriptions of schools in Chapter VII, from which the lists of products are taken.

and bath installed by the plumbing class. The large house is to be shingled and clapboarded, upper floors are to be laid, two of the rooms sheathed, and one of them plastered [p. 163]

Building partitions in cellar, teachers' lockers, supply cupboards, porch, storm house; laying floors, moving of portable school building [p. 173]

Painting and finishing

Steam pipes bronzed to match color of the walls. Floors oiled. Chairs for building bought in the white, finished and seated by pupils. Kitchen, dining-room, wood-working room, locker-rooms painted. Work benches and teachers' desks finished. Library room painted and papered [p. 165]

Bricklaying

All the brickwork for a small annex to one of the school buildings done by pupils [p. 164]

Plumbing

Installation of school kitchen and chemical laboratory fixtures, including the setting up of individual gas stoves, sinks with necessary connections, an instantaneous hot-water heater for the kitchen, and several lead-lined sinks for the laboratory. Structural and rail work with iron piping [p. 164]

Repairing closet tank, automatic tilting tank, broken water pipes, leak in flush pipe, sanitary drinking fountain, basin cocks; connecting gas plate, installing basin bowl, removing stoppage in basin waste [p. 173]

Electrical work

Repairing lights, telephone, fire gongs, motor; installing 5 H-P. motor, and stereopticon lantern [p. 173]

Machine shop

100 drill bases planed
1,700 drill blanks turned
cutting several hundred gears
300 bronze bushings
120 binder pulley shafts turned and ground
100 reverse clutches, bored and turned
50 to 75 lathe tool posts complete
several hundred grinder spindles complete
25 sets change gears, 12-inch lathes, complete
12 11-inch engine lathes complete
120 heavy forged screws
[p. 185]

Carpentry, plumbing, machine shop

All the carpenter work and plumbing required in the remodeling of a factory building purchased for the use of the school has been done by students. The repairing, overhauling, and reinstalling of the machine-shop equipment, partially destroyed by a recent fire, has also been done by students. For this work students were paid by the school at a rate per hour determined by their proficiency [p. 182]

Work done by girls

The girls prepare, serve, and manage the finances of the noonday lunch for the school, which is furnished to the students at cost. Pies, bread, etc., are also made by the girls and sold to private families. In the sewing work uniforms are made for the cooking class, overalls for the boys of the shop, curtains and various linen articles for the dining room, bedroom, etc., and a number of flags for the city school [p. 173]

Binding of 1,000 small notebooks, 100 teachers' manuals, and rebinding of 500 dilapidated books from neighboring school libraries [p. 182]

The weekly time schedule recommended for the vocational school is shown in Table 1, below, with the corresponding schedule for grade 7 of the regular course of study.

TABLE 1. TIME SCHEDULES

Vocational School		Regular Course of Study[6] Grade Seven	
Subject[7]	No. of minutes per week	Subject	No. of minutes per week
Shop work and drawing....	900	Industrial arts..........	180
		Art....................	90
Shop science and shop mathematics..................	150	Nature study...........	60
		Mathematics	150
Industrial geography-history and civics..............	150	History and civics.......	75[8]
		Geography..............	75[9]
English, penmanship.......	300	English.................	300
General use, recesses, physical education, opening exercises, study, music......	300	General use, recesses, physical education, opening exercises, study........	405
		Music..................	90
		Penmanship............	75
Total................	1,800	Total.............	1,500

It is recommended that all the academic subjects in the vocational school be related intimately to industrial needs and conditions, taking their points of departure, where possible, from the trades

[6] From the Course of Study for Elementary Schools, 1911.

[7] The subjects to be taken by the boys are given in the table. The corresponding subjects for girls should receive the same time allotment.

[8] One hundred and fifty minutes a week during second half-year (semester).

[9] One hundred and fifty minutes a week during first half-year (semester).

represented in the school. The science and mathematics should be treated largely as one subject, but not exclusively so. The geography-history and civics should be similarly treated and should include much of what is now offered in the "Chicago course." Specific illustrations of the kind of subject matter here referred to are furnished by the outlines, on pages 215-231 of this report, of academic subjects given in certain industrial courses.

The time available for the academic subjects in the vocational school (Table 2, below) is 135 minutes less than in the regular grade

TABLE 2

	In vocational school	In regular grade 7	In elementary industrial course[11]
No. of minutes per week available for the regular academic subjects.	600	735[10]	560

7, but 40 minutes more than that in the elementary industrial course recently provided. It is the opinion of the committee that if the academic subjects are organized and presented as indicated above a much more valuable type of training will result than that which is obtained from the academic subjects as usually presented in the regular grades 7 and 8, and that graduates of the vocational school would be qualified, on the academic side, to do the work of the high school at least as well as graduates of the regular elementary course of study. In Albany, New York, graduates of the vocational school are admitted to all courses in the high school [p. 174]. In Newton, Massachusetts, graduates of the vocational school are admitted to the technical courses in the high school [p. 178].

The committee believes that a school of this type, in which the vocational impulse of pupils is allowed opportunity for expression under expert direction, would aid boys and girls to "find" themselves. Those pupils who had decided on a particular vocation might here begin to prepare for it and those without definite aim might take a general course, made from the elements of several vocations, for the purpose of gaining a broad outlook that would make easier an intelligent choice in the future. Probably many pupils would thereby discover that they were not fitted for any of the vocations offered, a knowledge that might prevent anguish of soul and loss of time and energy in the future. For the pupil who

[10] Not including the time allotted to music.
[11] See p. 108.

discovers that his interests or talents do not lie in any of the vocations offered, this course makes easy the transition to business or profession.

The seriousness of this type of school should not be overlooked by the educator. A merely intensified form of manual training will not serve the purposes of the pupils nor of the industrial world. For the purposes of conventional culture the usual type of manual training serves fairly well; but it must not be forgotten that a vocational school is primarily for the purpose of enabling pupils to select and acquire a vocation. If pupils are allowed to dawdle and play with industrial elements they will gain false ideas of industry that will justify the criticism so often made that the schools fail to teach economy of time and effort. True, no school can give the powerful incentive to good industrial work that is forced on the business world by economic stress, but some knowledge of the value of time and well directed energy should be one of the important aims of the vocational school. A dilettante system of manual training with culture as its only aim will defeat the purpose of this school; but if the elementary processes of industry are shown in their relations to mathematics, language, history and science, pupils will feel a joy in work that comes from strength and skill and breadth of knowledge. Is not the belief justified that such a course would tend to prolong the school life of many boys and girls who would otherwise go into industry at fourteen?

Objections will be made that we are advocating specialization at too early an age. A study of statistics shows, however, that for a large percentage of children fate decrees specialization without preparation, at the end of the compulsory school term. This recommendation would substitute the specialization of school for the specialization of industry. Until the compulsory school age is raised what else can be done to keep pupils in school? And when the age limit is raised will it not still be necessary to give this type of education to the many who are not interested in the traditional academic training? Every attempt to introduce vocational training in this country impels the advocates of culture to protest. Unfortunately they do not show how the schools can give culture to pupils who refuse to attend. The experience of other American cities proves that a specialization that avoids " blind alleys " in education is not only feasible but highly successful. In Germany, according to Kerschensteiner (" Three Lectures on Vocational Training," p. 15),

"as a rule both boys and girls are ready to enter a calling at the close of their fourteenth year. From an educational point of view it is desirable to make fourteen the age for commencing, for there can be no doubt that working at a trade is or might be an essential factor in the formation of character." If Germany is satisfied to begin regular trade apprenticeship at fourteen it would seem that the less highly specialized form of education proposed by the committee might safely be tried at thirteen, especially as a change of purpose is allowed for by the flexibility of the course. It is important that pupils be allowed to take this course before the end of the compulsory period so that their school interests may be strengthened sufficiently to withstand the allurements of immediate wages.

2. Elementary Industrial Schools for Over-age Children Below Grade Seven

In at least three centers of the city, establish an ungraded industrial school for boys and girls in grades below the seventh who are at least twelve years of age and who have lost interest and fallen behind in the regular grade work. At least half of the time should be given to such handwork and drawing as will appeal to the vocational motive and interest of the pupils. The academic subjects should be adapted to the previous attainments of the pupils and should be closely related to the handwork and to industrial needs. The school should aim to develop the pupils on the academic side, largely by individual work, so that they may in time return to regular work in the grades. Thirty hours (60 minutes each) a week.

The shopwork should include the elementary phases of some of the trades listed under type 1, above [p. 15]. In addition, general repair work and the making of equipment and apparatus in large quantities for use in the schools should be introduced. Examples of such shopwork may be found in the detailed description of schools in Chapter VII, especially pages 162-170.

3. Optional Industrial and Commercial Courses in Grades Seven and Eight

In at least three centers of the city, offer a differentiated curriculum in grades 7 and 8, open to pupils who have finished grade 6, and including the following three courses of study[12]:

[12] A good example of such a curriculum is found in the Fitchburg grammar school [see p. 164]. A fourth course similar to the Literary Course in the Fitchburg grammar school might well be offered in each of these centers. In this course one-sixth of the time should be given to a modern foreign language, one-sixth to shopwork and drawing for boys and household arts for girls, and the remaining time to academic studies similar in the main to those in courses (1) and (2). Thirty hours (60 minutes each) a week.

(1) An industrial course giving one-third of the time to shop work and drawing for boys, and household arts and design for girls, the remainder of the time being devoted to related academic studies. Thirty hours (60 minutes each) a week.

(2) A commercial course giving one-third of the time to bookkeeping, business forms and methods, business arithmetic, typewriting, and handwork, and the remainder of the time to related academic studies. Thirty hours (60 minutes each) a week.

(3) The present course of study regularly provided for grades 7 and 8. Twenty-five hours (60 minutes each) a week.

Graduates of any one of the above three courses should be admitted to any course in the high school.

The weekly time schedule recommended for course (1)[13] is shown in Table 3, below, with the corresponding schedule for the elementary industrial course recently authorized for Chicago schools. The latter course is outlined in the Course of Study, adopted June 29, 1910, but it is not yet actually given in any of the schools.

TABLE 3. WEEKLY TIME SCHEDULES

Elementary Industrial Course (proposed) | Elementary Industrial Course (recently authorized)

Subject[14]	No. of minutes per week	Subject	No. of minutes per week
Shop work and drawing.....	600	Art and industrial arts....	615[15]
Applied science, applied mathematics............	150	Nature study...........	60[15]
Industrial geography–history and civics, Chicago course..................	180	English, history and civics, mathematics, geography, Chicago course (special), penmanship..	500
English..................	300		
Penmanship..............	75		
Physical education, study, general use, recesses......	405	Physical education, music, study, general use, recesses................	325
Music....................	90		
Total.................	1,800	Total...............	1,500

[13] A similar time schedule is recommended for course (2).

[14] The subjects to be taken by the boys are given in the table. The corresponding subjects for the girls should receive the same time allotment.

[15] For purposes of comparison the time assumed to be allotted to nature study is taken from the industrial arts period and is scheduled separately.

Course (1), above, is recommended to take the place of the elementary industrial course recently authorized for grades 6, 7, and 8. The two courses differ in the following three respects: (a) course (1) is not recommended for grade 6; (b) five hours more per week are recommended in course (1), making it possible to give more time to the academic subjects; (c) a more practical kind of shopwork is recommended for course (1).

The committee's reasons for not recommending course (1) for grade 6 are based on two principles fairly well settled in current practice in such courses: in the first place, such courses are not in general offered to pupils below twelve years of age, and in the second place, the completion of the sixth grade is commonly accepted as a standard, on the academic side, for admission to such courses. Retarded pupils who are twelve years of age in grade 6 or below are provided for in the committee's recommendations in type 2, above. It is unnecessary and unwise, in the opinion of the committee, to give so little time to academic subjects as is scheduled in the elementary industrial course recently authorized for Chicago schools. With the time allotted to handwork, the school week can readily be lengthened by five hours without bringing undue fatigue upon pupils, thus providing more time for academic subjects. The shopwork for course (1) should include the elementary phases of some of the trades listed under type 1, above [p. 15]. In addition, general repair work and the making of equipment and apparatus in large quantities for use in the schools should be introduced. Examples of such shopwork may be found in the detailed descriptions of schools in Chapter VII, especially pages 162-170.[16]

The academic subjects in courses (1) and (2) should be closely related to industrial and commercial needs and conditions in the manner indicated in the recommendations for the academic subjects under type 1, above [p. 18].

4. Trade School for Boys

Within the next two years establish a trade school for boys, admitting those who have been graduated from the vocational school, and others who have reached the age of sixteen with an academic training equivalent to that of the sixth grade. This school should provide for specialization, for at least two years, in some one of a

[16] A fuller discussion of the questions involved in this paragraph is given on pp. 109-111.

number of trades, giving at least two-thirds of the time to shopwork and drawing in the trade selected, and the remaining time to very closely related academic subjects. The school year should be eleven months, and the school day at least seven hours.

5. Trade School for Girls

Establish a trade school for girls, admitting those who have been graduated from the vocational school, and others who have reached the age of fourteen with an academic training equivalent to that of the sixth grade. Specialization in a particular trade should be offered, about two-thirds of the time being devoted to handwork. Further investigation of local industrial needs is necessary to determine the trades to be taught.

6. Apprentice Schools

Investigate the feasibility of establishing apprentice schools for trades other than carpentry.

7. State Legislation for Day Continuation Schools

Endeavor to procure the enactment of a law, similar to the Ohio law, permitting local school authorities to require attendance in day continuation schools of working boys and girls between the ages of fourteen and eighteen, or at least fourteen and sixteen, for at least six hours a week.

8. Coöperation with Employers to Secure Day Continuation Schools

Endeavor to secure for the present the voluntary coöperation of employers in the establishment of day continuation schools in commercial and industrial subjects, for the years fourteen to eighteen. The work in these schools should be of the same general character as that in the continuation schools of Munich, Germany [see pages 119 ff. and 204 ff.], and in the recently revised curriculum of the Chicago apprentice school [see p. 112 ff.].

The following suggestions may be drawn from the experience of other cities with the voluntary coöperation of employers in day continuation schools [see p. 128 ff.].

(a) The alternate week plan of coöperation is most likely to succeed on the high-school level, and in connection with school instruction distinctly technical in character, preparing for positions of responsibility above that of the actual mechanic.

(b) The experience of Cincinnati and Boston [see p. 200 ff.] shows that large numbers of employers are willing to give from four to fifteen hours a week to their employees, on full pay, for day continuation instruction very definitely related to the daily work.

(c) Most of the successful efforts at coöperation have been made through associations of employers and workmen, and have been accompanied by the appointment of advisory committees of employers and unions to secure their continued interest and their criticism and advice on the work of the schools.

(d) Provision should be made for some kind of supervision by the school of the work of the students while in the factory. There are two reasons why this should be done: first, to enable the school to relate its instruction as closely as possible to industrial needs and conditions; second, to afford some protection to the student against possible exploitation by the employer, to see that the student advances on the shop side of his training as rapidly as his ability permits.

9. Legislation to Raise the Compulsory Age Limit

After vocational training is provided for the years fourteen to sixteen, endeavor to procure legislation to raise the compulsory age limit to sixteen years. The statistics on the "wasted years" from fourteen to sixteen, given on pages 33-39 of this report, show the great need for such legislation.

10. Technical and Trade Courses in the High School

In the "manual training course"[17] in the technical high school the time devoted to shopwork and drawing in the first two years should be increased so that the work which now requires three years for completion may be done in the first two. The school day should be lengthened at least 60 minutes, thus increasing the capacity of the shops — and consequently of the school — by one-third.

In the last two years opportunity should be given for specialization in a particular trade or technical subject, students giving from one-half to two-thirds of the school time to the major subject. Opportunity should also be given, in the last two years, for students intending to enter college engineering courses to take subjects which meet the college admission requirements.

[17] The name of the course should be changed to "technical course," to conform more closely with the aim of the course recommended.

Provision should also be made in the technical high school for the boy who has been graduated from the elementary school before the age of sixteen, and who wishes to enter the trade school at sixteen. Such pupils should be permitted in the first year or two of the high-school course to give more than the usual amount of time to such shopwork as will prepare directly for the trade school — shop work of the same general character as that recommended for the vocational school [type 1, p. 15].

A thoroughly organized effort should be made to relate the subject matter of the academic studies closely to the shop work and to industrial needs.

The trades furnishing appropriate shopwork for the "manual training" course may be classified in the following groups:

Building trades

Carpentry, plumbing, steamfitting, sheet-metal drafting, electrical construction, tilesetting, concrete work, painting (house, sign, and fresco), architectural drawing

Machine trades

Patternmaking, forge, foundry, bench and vise work, machine practice

Furniture trades

Cabinetmaking, finishing, upholstering

Printing trades

Typesetting, bookbinding, lithography, engraving

Miscellaneous

Stationary engineering, pharmaceutical and industrial chemistry, commercial design, jewelry, silversmithing, pottery, photography

Parallel to the existing two-year technical college course, which offers a broad training for engineering students, establish in the technical high school more highly specialized two-year college courses for the purpose of preparing students to enter the higher ranks of industry or to become teachers of shopwork or drawing in technical schools. If the industrial Chicago of the future is to keep the promise of its past the schools must produce efficient leaders below the rank of engineers. By training leaders of this type Chicago will receive a quick economic return on her educational investment.

11. Coöperative Courses in the Technical High School

The coöperative plan of alternate weeks in school and factory, now offered in the fourth year of the Lane Technical High School,

should be introduced into the third year also, and should be offered in all technical high schools.

12. Industrial Courses for Girls in the High School

In the Flower Technical High School the time allotted to handwork, including drawing, should be increased so as to occupy from one-half to two-thirds of the school time.

Industrial courses for girls, permitting specialization in the last two years, should also be offered in the remaining technical high schools. In these courses, from one-half to two-thirds of the school time should be given to handwork, including drawing. Opportunity should also be given in the last two years for students intending to enter college technical courses to take subjects necessary to meet the college entrance requirements.

The following occupations are suggested as furnishing appropriate material for the industrial courses for girls:

Dressmaking, millinery, cloakmaking, cooking, catering, lunch-room management, homemaking, house sanitation and management, preparatory courses for nurses, dietetics, care of infants and invalids, house decorating and fitting, laundering, jewelry, silversmithing, pottery, photography, commercial design, bookbinding.

The subject matter of the academic studies should be closely related to the handwork and to industrial needs.

13. Central High School of Commerce

Establish a central high school of commerce, and secure the coöperation and advice of representative business men in organizing a course of study and in providing for part time work of students in business offices. The commercial high schools of Boston and Cleveland [see p. 245 ff.] furnish good illustrations of the organization and type of work here in mind.

14. Present Commercial Courses in the High School

Improve the commercial courses now offered by relating them more closely to present business needs and practices.

PART II

INDUSTRIAL EDUCATION IN CHICAGO AND IN OTHER CITIES

By

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CHAPTER II

THE NEED OF CHICAGO SCHOOLS FOR INDUSTRIAL EDUCATION

This chapter presents a consideration of the need for industrial education in Chicago as shown (a) by the elimination of pupils from school, (b) by the number of over-age or retarded children in the elementary grades, and (c) by facts relating to children not in school between the ages of fourteen and sixteen years.

Manual training and industrial training

A distinction is made throughout this report between manual training and industrial training, in the sense that the latter aims primarily and definitely at preparation for industrial vocations, whereas the former aims at the general education of the individual, through the hand, whatever his vocation is to be.

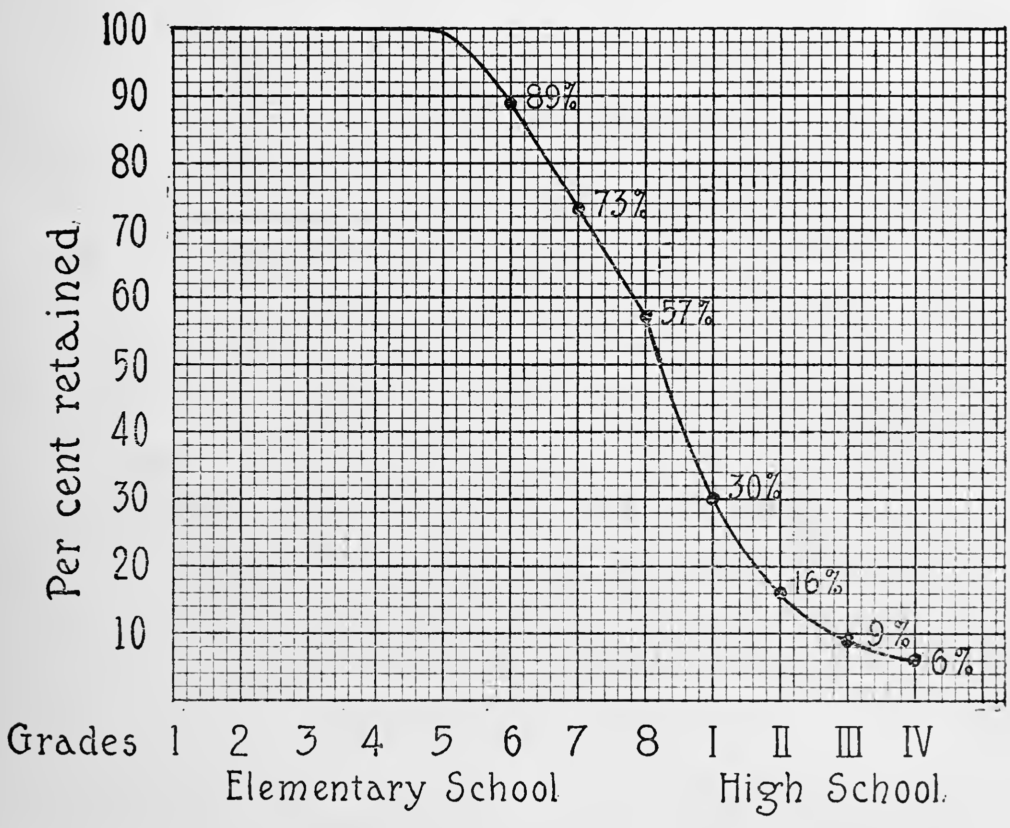
In presenting the need for industrial training it is not the purpose of this report to minimize the value of manual training, as such, in the public schools. The two kinds of training, as defined above, are not antagonistic. Even though some phases of the actual tradework done in present industrial schools may be introduced into manual training courses, to vitalize and enrich those courses, they may still remain general in character, and may operate for the general education of the individual, without regard to the specific vocation he is to follow. The term industrial training, however, is reserved for those courses which lay definite hold upon the vocational motive of pupils, which give more time to handwork than manual training courses give, and which sooner or later provide specialized and intensive training for industrial pursuits.

It is, then, the purpose of this chapter to show that the vocational motive should be introduced into the school by way of industrial courses, to assist in retaining pupils longer under school influence, to help arouse the interest and further the progress of retarded or over-age pupils, and to reduce the waste incident to the years fourteen to sixteen in the case of children who leave school at fourteen. The grades in which the greatest need exists for industrial courses will also be pointed out.

Elimination of pupils

The enrolment statistics of the Chicago schools, for the year 1910, show (Fig. 1) that of the number of pupils entering the first grade only 57 per cent were in the eighth grade, 30 per cent in the first year of high school, and only 6 per cent in the last year.

FIG. 1.[1] PERCENTAGE OF PUPILS RETAINED IN CHICAGO PUBLIC SCHOOLS, ACCORDING TO THE SCHOOL REPORT, 1910



[1] The percentages are based on total enrolment. The method of computation is that used in Ayres, *Laggards in Our Schools*.

Fig. 1 shows, in other words, that 43 per cent of the pupils who entered the first grade did not reach the eighth grade, 27 per cent did not reach the seventh grade, 11 per cent did not reach the sixth grade, and 94 per cent did not complete the high-school course.[2]

Since only 86 per cent of the 57 per cent enrolled in grade eight were promoted to the high school[3], the number who *completed* grade eight in 1910 was only 49 per cent of the number who entered grade one.

The largest gap between two successive grades is the gap between the eighth grade and the first year of high school, 27 per cent of the pupils dropping out at this point. In an effort to bridge this gap the Board of Education has recently provided two-year vocational courses for the first two years of the high school. It is quite evident from the above figures, however, that these vocational courses, with graduation from the eighth grade as a prerequisite, do not meet the greatest need of the schools as shown by the dropping out of pupils, for 43 per cent of the pupils leave school before reaching the eighth grade. The greatest need for vocational courses to hold pupils in school is apparently in grades 6, 7 and 8, which is the field occupied by the Farragut Elementary Industrial School.

The Chicago schools are neither much worse nor much better than the schools of other cities with respect to the percentage of pupils retained.[4] In general it is charged that the large percentage of elimination indicates that the schools are not suited to the abilities and interests of most of the pupils. The following statements give further evidence of this condition in Chicago schools.[5]

(1) The average pupil in the first five grades progresses at the rate of eight grades in 10.4 years.

(2) Over 69,000 pupils (32 per cent of the total) in elementary schools are one year or more behind grade.[6] This retardation is greatest in grades 4, 5 and 6.

(3) Over 36,000 pupils in elementary schools (17.4 per cent of the total) repeat the work of a grade one or more times.[7]

[2] The method of computation here used does not show that any pupils leave school below the sixth grade, although Table 6, p. 36, shows that some do leave below the sixth grade.

[3] See promotion statistics, School Report, 1910.

[4] Average percentages for 63 cities, given in Ayres, *op. cit.*, are: grade 6, 90 per cent; grade 7, 71 per cent; grade 8, 51 per cent; grade 9, 40 per cent; grade 10, 19 per cent; grade 11, 14 per cent; grade 12, 10 per cent.

[5] Based on School Report, 1909, and on the methods of computation used in Ayres, *op. cit.*

[6] See Table 4, p. 31.

[7] Counting the repeaters in the first five grades only.

(4) The money cost of this repetition is over $1,300,000.[8]

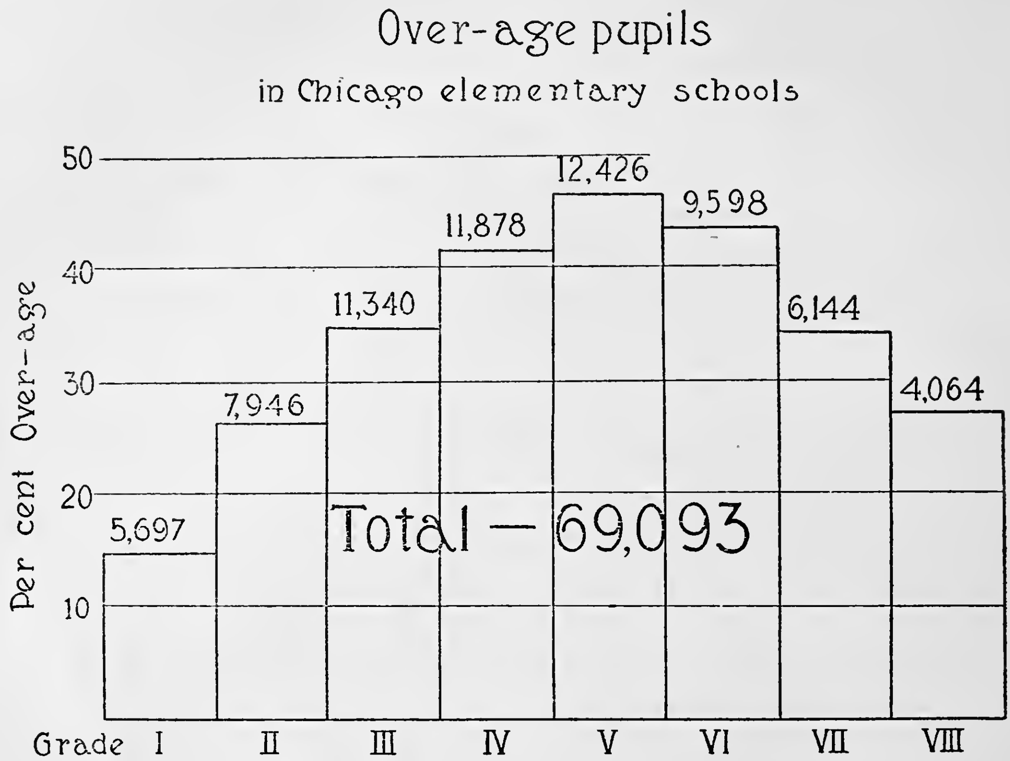
(5) There is 15 per cent more retardation among boys than among girls; there are 23 per cent more repeaters among boys than among girls; and the percentage of girls in grade 1 who enter the eighth grade is 15 per cent greater than the percentage of boys.

TABLE 4. NUMBER AND PER CENT OF OVER-AGE PUPILS IN CHICAGO ELEMENTARY SCHOOLS, BASED ON SCHOOL REPORT, 1909[9]

Grade	One year or more over-age		2 years or more over-age	3 years or more over-age	4 years or more over-age
	Number	Per cent			
1	5,697	14.8	2,050	976	549
2	7,946	26.1	3,417	1,542	835
3	11,340	34.6	5,146	2,451	1,091
4	11,878 }	41.7 }	5,995	2,547	740
5	12,426 } 33,902	46.5 } 44.0	5,890	1,855	403
6	9,598 }	43.8 }	3,608	855	135
7	6,144	34.2	1,841	326	43
8	4,064	27.4	1,001	156	25
Total	69,093	32.7	28,948	10,708	3,821

[8] It is not here implied that this amount of money would be annually saved if there were no repetition in the schools.

[9] Over-age here refers to children above normal age *for whatever cause*. Ayres has shown that only a small part of this retardation is due to pupils who start late in grade 1. This is also shown by age statistics in the Chicago School Report, 1909. The ages regarded as normal in Table 4 are: grade 1, seven years; grade 2, eight years; . . . grade 8, fourteen years. It has been shown that the method of computation here used (that of Ayres) probably minimizes considerably the actual percentage of retardation in Chicago schools (see *Elementary School Teacher,* June, 1910, p. 478).



It is evident from the facts given that the Chicago schools give the training of the eight grades to about half of the children who enter. It is not safe to assume that most of the children who leave school before completing the eighth grade do so because parents can not afford to keep them in school. This assumption is frequently made, tacitly or explicitly, but it is not supported by sufficient evidence. Indeed, the evidence that exists [see pages 37, 38] indicates that very likely most of these children leave school because the school does not provide the kind of training needed. Since the instruction in the lower grades is not suited to the abilities and interests of the average child, about half drop out at the age of fourteen, having lost a year or more since entering. It is evident also that instruction in the grades is better suited to the needs of the girls than to those of the boys.

The large number of over-age children in grades 4, 5 and 6 points to the importance of introducing vocational courses in the elementary grades. These retarded children are the ones most likely to drop out to go to work when they reach the compulsory age limit of fourteen years. The elimination begins, as shown in Fig. 1, in grade 6. Special vocational courses beginning below grade 6 should

therefore be of service in arousing the interest of the retarded pupils and in retaining them in school.

The "wasted years," fourteen to sixteen

The need for industrial education is closely associated with the problem of the "wasted years" of childhood, between fourteen and sixteen, when, as is shown below, large numbers leave school to go to work, although these years in the industries offer little by way of financial compensation, or by way of vocational training and advancement. Wide interest has been aroused in educational circles by the statement of this problem as made in the report of the Massachusetts Commission on Industrial Education, 1906.

Fig. 2 reveals conditions in Chicago, with respect to these years, even worse than those presented in the Massachusetts report. In

FIG. 2[10]

23,415 CHILDREN

between fourteen and sixteen years of age in Chicago

ARE NOT IN SCHOOL

Nearly three-fourths of these children left school in grade 7, or below — over	16,000
Over one-half left in grade 6, or below — over	11,000
Nearly one-third left in grade 5, or below — over	7,000

Massachusetts the number of children between fourteen and sixteen years of age who were not in school was about 25,000, which is about seven-tenths of one per cent of the total population of the State,[11] whereas the 23,415 children in Chicago represent 1.1 per cent of the population of the city.[12] The Chicago children also, before leaving school, have not reached so high a grade as the Massachu-

[10] Based on the school census for 1910 (see Table 5) and on the records of 49,002 children receiving age and school certificates (see Table 6). In Fig. 2 the assumption is made that the percentage of elimination for the various grades as shown in Table 6 holds true also, in an approximate way, for the 23,415 children not in school.

[11] The population in 1906 was estimated from the United States Census, 1900, 1910.

[12] United States Census of 1910.

setts children.[13] Only one-fourth of the 23,415 children not in school in Chicago had received eighth-grade training, and only four per cent had been in high school.[10]

What becomes of these children in Chicago? Over half of them (11,750) were idle — neither in school nor at work — according to the census enumerators (Table 5). The rest were stated to be at work, 36 per cent (4,223) in miscellaneous occupations, 29 per cent (3,384) in factories, and 34 per cent (4,058) in stores and offices. However, a simple bit of reasoning shows that if half of these children were idle when the census was taken[14] the chances are that the average child works only half the time between fourteen and sixteen years of age. Stated in other words, *the average boy or girl who leaves school at fourteen years of age is doomed to one year of idleness in the first two years out of school.*

TABLE 5.[15] POPULATION BETWEEN FOURTEEN AND SIXTEEN YEARS OF AGE IN CHICAGO

	Number	Per cent
Not in school		
Idle	11,750	14.6
At work	11,665	14.4
Total	23,415	29.0
In school		
Public	43,415	53.9
Private	13,636	16.9
Total	57,051	70.8
Total population		
Between 14 and 16	80,466	....

[13] The percentages for Chicago (from Table 6) and for Massachusetts are:

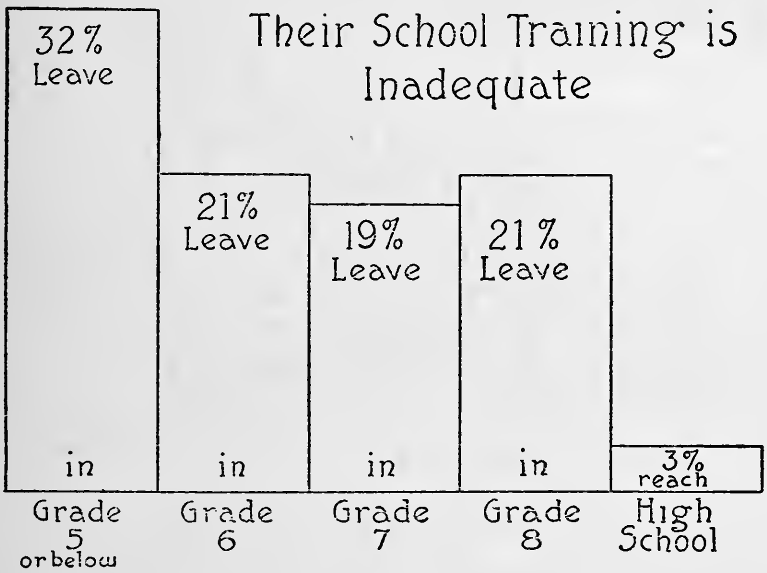
	Per cent leaving in		
	Grade 7 or below	Grade 6 or below	Grade 5 or below
Chicago	71.7	52.4	31.4
Massachusetts	64.1	38.8	20.5

[14] The school census of 1908 showed that over 59 per cent of the children not in school between fourteen and sixteen years of age were idle when the census was taken.

[15] From the School Census Report, 1910, on which Table 5 is based, the following classification of children between fourteen and sixteen years of age may be made: the number in school, the number at work, and the number "not in school for 30 days."

All of these children left school to go to work, but they find the industrial field already flooded with juvenile workers. Very few are wanted in the skilled industries, to learn a trade, until they are sixteen or eighteen years of age.[16] The State law specifically prohibits more than twenty occupations to these children and limits their working day to eight hours. They have little or no manual skill to offer the employer and they have received very little school training (Fig. 3). Employers in all grades of industry show an increasing aversion to employ children under sixteen years of age.[17]

FIG. 3



Based on 36,464 Age and School Certificates 1903-06

The Massachusetts investigation bears out the statement that most of these children flit about from one juvenile occupation to another, with intermittent idleness for weeks at a time, all of which serves to develop "that unsteadiness of purpose, irresponsibility of character,

The number idle in Table 5 is the number given in the census as "not in school for 30 days." Since the State law requires children between fourteen and sixteen to attend school, if not at work, it is assumed that the children "not in school for 30 days" had either been at work but were idle when the census was taken, or had been excused from school to seek work and had not yet found a place. The School Census Report [p. 6] shows that of 16,672 children holding certificates only 3.1 per cent (mainly girls) were helping at home.

[16] See p. 46. See also Report of New York State Bureau of Labor Statistics, 1908, Part I, Industrial Training.

[17] Chicago School Report, 1908, p. 285.

and irregularity of habit which is the undoing of manhood and womanhood."

TABLE 6.[18] GRADES OF 49,002 CHILDREN RECEIVING AGE AND SCHOOL CERTIFICATES BETWEEN FOURTEEN AND SIXTEEN YEARS OF AGE

GRADE	1903–1906		1908–1909	
	No.	Per cent	No.	Per cent
From grade 5[19], and below.....	11,803	32.3	3,630	28.9
From grade 6................	7,716	21.1	2,579	20.6
From grade 7................	6,984	19.1	2,433	19.4
Total below grade 8.......	26,503	72.6	8,642	68.9
From grade 8................	7,660	21.0	2,278	18.1
From high school.............	1,370	3.7	770	6.1
Evening schools and unclassified	931	2.6	848	6.7
Total certificates issued....	36,464	....	12,538	....

The eagerness with which children leave school to go to work is shown in the fact that of the 12,538 children receiving age certificates in 1908-9, 3,259 or 25.9 per cent were not more than 14 years 1 month of age, and 6,660 children, or 53.1 per cent were not over 14 years 6 months of age.[20] These children do not wait long to leave school after they become old enough to go to work.

That few children return to school after receiving age certificates is shown by an investigation of 16,672 children holding certificates. Of this number only 2,947, or 17 per cent were in school,[21] apparently compelled to return to school by the attendance officers who found the children neither in school nor at work.

On page 277 of this report it is estimated that boys between fourteen and sixteen years of age in Chicago earn on the average about $4.25 a week. The United States census of manufacturers for 1905

[18] From School Reports, 1906, 1909.

[19] The grades indicated were not necessarily completed by all pupils.

[20] School Report, 1909, p. 81.

[21] School Census Report, 1910, p. 6. The investigation covered a period of 1½ years. The number who had moved or left the city is subtracted from the total investigated. Principals state that some children remain in school after receiving age certificates, engaging in some gainful occupation outside of school hours. It is practically impossible to find out what this number is, but it is probably very small. That most or all of this number probably do leave school soon after receiving certificates is shown by the investigation of the 16,672 children referred to. It has also been shown that work in vacations tends to lessen the school interest of pupils and to increase the elimination (see *Report on Condition of Woman and Child Wage-earners in the United States,* Vol. VII, pp. 55, 60, Bureau of Labor, Washington, 1910).

shows that boys and girls between fourteen and sixteen in the manufacturing industries of Chicago earn an average of $195 a year, less than $4 a week. These wages are for the time the children are at work, but, as stated before, the chances are that the average child works only half the time during these years, which reduces his earning power to about $2 a week for the period.

Why, then, do these children leave school? When this question was asked of 205 boys in connection with the investigation reported on page 277, over 90 per cent said they were tired of school and could have remained in school so far as their financial circumstances were concerned. Fully 75 per cent said they would have continued in school if trade instruction had been offered.

The Massachusetts investigation, covering 5,423 children and 3,157 families, disclosed the following interesting facts with reference to children between fourteen and sixteen years of age who were not in school:[22]

76 per cent of the families were financially able to give industrial school training to their children;

66 per cent of the children could have continued in school had they wanted to;

55 per cent of the families declared they would send their children to trade schools, if such schools should be provided.

Still further evidence that many pupils who leave the public school would be attracted by distinctly vocational training may be found in the large number enrolled in correspondence and other private vocational schools conducted as business undertakings for profit. Fig. 4 gives an estimate of the enrolment and the amount of tuition paid in private commercial and industrial schools located in Chicago and conducted for profit. The figures given do not include the enrolment of Chicago students in correspondence schools, or in Y. M. C. A. and parochial schools.

[22] From an article by Susan M. Kingsbury in *Charities and the Commons*, October 5, 1907. The statements on the financial condition of the families are based on careful investigation and on definite standards of income and expenditure.

Fig. 4. Enrolment in Private Vocational Schools and in Public High Schools of Chicago[23]

There are at least	There are only
19,000 STUDENTS	**17,781 STUDENTS**
in	in all
Private Commercial Schools and **800** in **Private Industrial Schools** in Chicago, and at least	**Public High Schools** in Chicago and only
$1,485,000	**$1,114,526**
is paid for	is expended for
TUITION	**MAINTENANCE**

The large number of students who are willing to pay for instruction in these private schools shows in a convincing way the strong demand for practical training in commercial and industrial pursuits. It is shown in Chapters X and XIII that a large number of children leave the public high and elementary schools of Chicago to enter private business colleges. In the case of students from other cities an additional cost for living expenses is, of course, involved.

That a year or more in the ordinary school would be of value to the children who leave at the age of fourteen is shown by tests in practical arithmetic, English, etc., given to 655 boys who left school in grades from the high school down to the sixth grade.[24] These tests, while showing a deplorable deficiency in most of the boys, nevertheless exhibit a consistent superiority of the upper grade boy over the boy from the next lower grade.

But the ordinary school, as shown by the statistics given, does not attract and hold the majority of the children until they have completed the eighth grade. That intermediate industrial schools and courses, giving definite and practical preparation for vocations, would attract large numbers, may be easily inferred from the facts which have been presented. That employers and organized labor

[23] Based on total annual enrolment in each case. The figures for the public schools are taken from the Superintendent's Report, 1910, and refer to day schools only. The figures for the private schools are obtained from the estimates for commercial schools given in Chapter X, and from the two industrial schools described on pp. 142, 143. It is, of course, not assumed that the 19,800 students in Fig. 4 include only Chicago students of public school age.

[24] See p. 272 ff.

in Chicago would welcome such schools for children between fourteen and sixteen years of age is shown in Fig. 5.

FIG. 5[25]

148 employers
having
101,449 employees

AND

92 trade unions
having
97,000 membership

in

Chicago

are in favor of

INDUSTRIAL SCHOOLS FOR THESE CHILDREN

Such schools and courses, if they are to attract pupils and parents, and if they are to win the confidence of employers and workmen, should be distinctly and frankly practical in their aim and work, not excluding, however, academic instruction closely related to industrial needs. Experiments in other cities present the three following types of schools and courses which have been developed in an effort to meet this need.[26]

1. Optional industrial courses in grades 6 to 8, inclusive, parallel to existing grammar school courses, and not interfering with graduation from the elementary school in the usual time.

2. Industrial schools and courses for elementary school pupils thirteen to fifteen years of age, which do not offer the possibility of graduation in the usual time.

3. Independent industrial schools, offering trade training of a preparatory kind to children fourteen to sixteen years of age from grade 6, or above.

Conclusions

The opinion is common in educational circles that the eight grades of the elementary school represent the minimum school training that should be required of all children not incapacitated by

[25] Based on Table 10, p. 47, and on Table 19, p. 75. The 92 trade unions, being 82.8 per cent of the number of unions answering the question, may be said to represent a membership of at least 97,000.

[26] See Chapter VII.

nature for receiving that training. It is indeed humiliating when one realizes that only half of the children in the public schools of Chicago receive this minimum. Those who leave school with less than this minimum enter the industries under the handicap of an insufficient school training. The first two years out of school for those who leave at fourteen are at present largely wasted, both to the child and to the industries — to the child because he finds little or no opportunity for training or advancement in the industries, because he receives little or no general training of a beneficial kind and may be subject to much harmful influence incident to idleness and shifting occupation; to the industries because children are not prepared to take positions as trained workers when they are old enough to do skilled work. But these years could be made of great value for school training along vocational lines, and there are good reasons for believing that many children who now leave school at fourteen could be retained in school by such training.

To the school is thus presented the opportunity to extend its influence over a portion of the community not hitherto reached. By appealing to the vocational motive, the school may provide that training in skill which the industries themselves no longer adequately provide,[27] and it may at the same time continue the general education of the children on the academic side by quickening their intelligence and interest in the active life they are to enter.

Whatever may be the cause, the fact remains that large numbers of children leave school at various points in the course. The school can hardly be considered as doing its full duty, as a social institution, unless it provides for each pupil, before he leaves school, that training which best fits him for the life he is to enter. The conditions and needs of the life he is to enter must be studied by the school, and a curriculum should be provided which does not assume that all pupils will take the complete course and go on through college, but which offers at various appropriate points finishing courses which prepare definitely for a life career.

It should be clear, from the statistics given, that the greatest need for such finishing courses, and for vocational courses to hold pupils in school, is in the intermediate grades, for the years twelve to sixteen. Technical education in the high school is, of course, important, but it does not reach the large number of children who never

[27] The meagerness of provisions in the industries of Chicago for training skilled workers is shown in Chapter III.

enter the high school, but who enter the industries under the handicap of an insufficient school training. It is much more important that all children should receive the equivalent of an eighth grade training than that a few more than at present should enter the high school.

Industrial training of an introductory or rudimentary kind should begin at the age of twelve or thirteen, in whatever grades the children of that age may be found, in order to reach them before they have an opportunity to leave school. Such industrial courses, from two to four years in length, should serve as finishing courses for those who must enter the industries at an early age. It is the distinctive opportunity of the high school, and therefore its duty, to take advantage of the superior academic attainments of its pupils by training mainly for positions above that of the actual mechanic, for the directive positions in the industries. Such technical courses in the high school, if they are true finishing courses preparing definitely for a life career after high school, should be of service in retaining in the high school many pupils who now leave before completing the course. On the lower academic levels the industrial courses should provide for the actual mechanic of the future the training in skill which is needed in the industries, and should give as much of the technical instruction in applied science, mathematics, knowledge of materials, etc., as the academic attainments of the pupils will permit. Such elementary courses should give that all-around training in skill which is not generally obtainable in the industries, and should endeavor to develop such a degree of industrial intelligence and adaptability as will make rapid advancement possible after work is begun.

CHAPTER III

CONDITIONS IN THE SKILLED INDUSTRIES OF CHICAGO

AND

THE ATTITUDE OF EMPLOYERS

To ascertain the need for industrial education as shown by conditions in the skilled industries of Chicago, and as shown by the attitude of the employers toward industrial schools, the following schedule of questions[1] was sent to employers in selected industries in the city:

1. From what source do you obtain your skilled employees — employees of high-grade skill, and of medium or low-grade skill?

(a) Are they trained in your own establishment?......................

(b) Are they obtained from other sources?..........................
If so, what are these sources?...............................

2. Do you have difficulty in obtaining or in training skilled employees?
....

3. Do you have difficulty in obtaining or in training employees to act as foremen or department heads?..

4. Would the efficiency and future opportunities of your employees be increased if they received a training between the ages of fourteen and sixteen in a *general public industrial* or *preparatory trade school* which aims to give a knowledge of materials, shop mathematics and fundamental industrial methods, and some ideas of industrial organization, but does not teach a special trade? ....

5. Would practical *day trade schools,* giving a specialized and intensive training of one year or more after the age of sixteen, help to meet the problem of skilled employees in your business?..............................

6. Would practical *evening* or *half-time schools* be of value in helping unskilled workers, or those of low-grade skill, to advance to positions requiring high-grade skill?...

7. To what extent could your business be advanced if more skilled workers were available, and if greater industrial or business intelligence prevailed among foremen or department heads?.............................

[1] The questions were suggested by similar questions given in the Report of the Bureau of Labor Statistics, New York State, 1908, Part I, Industrial Training. Some of the questions are taken *verbatim* from that report.

8. Total number of employees in the manufacturing department:
male.............................; female................................

Number of employees under sixteen years of age:
male................................; female............................

EMPLOYEES OF LOW-GRADE SKILL

9. Number of employees of medium or low-grade skill, operating one machine, or carrying on one process, requiring small degree of skill:
male................................; female............................

Weekly wages of this class, not counting overtime:

	Male	Female
Highest	....	....
Lowest	....	....
Wages of greatest number	....	....

10. Number of employees being trained for work in this low-grade class under the age of eighteen years:
male.............................; female...............................

EMPLOYEES OF HIGH-GRADE SKILL

11. Number of employees of high-grade skill with knowledge of all processes, or a number of processes, or high skill in one process:
male.............................; female...............................

Weekly wages of this class, not counting overtime:

	Male	Female
Highest	....	....
Lowest	....	....
Wages of greatest number	....	....

12. Number of employees being trained for work in this high-grade class under the age of eighteen years:
male.............................; female...............................

13. If you have a system of training employees for skilled work or for supervisory work, please give some description of it.......................

The industries selected for investigation were on the whole those requiring a comparatively large amount of skilled work. In addition, the packing houses were included because of the importance of this industry in Chicago, although it requires a relatively small amount of skill. One manufacturing confectionery, one wall-paper mill, and one mail-order house were also canvassed, and are included in some of the following tables under the heading "miscellaneous."

As a rule those establishments were selected, in a given industry, which employed the largest number of persons. Reports were

received from 181 establishments, having 111,606 employees,[2] classified in ten industrial groups, as follows:

TABLE 7. NUMBER OF ESTABLISHMENTS REPLYING AND NUMBER OF EMPLOYEES THEREIN, BY INDUSTRIES

INDUSTRY	Number of establishments	Number of employees		
		Male	Female	Total
1. Industries employing mainly women	36	1,591	4,092	5,683
2. Men's clothing	9	2,837	2,240	5,077
3. Iron, steel and electrical products	49	49,222	4,863	54,085
4. Contractors and builders	17	5,326	32	5,358
5. Furniture, office fixtures	10	4,330	356	4,686
6. Printing	35	3,907	1,182	5,089
7. Jewelry manufacturing	11	279	118	397
8. Packing houses	7	19,911	1,778	21,689
9. Pianos, musical instruments	4	1,164	78	1,242
10. Miscellaneous	3	4,495	3,805	8,300
Total	181[3]	93,062	18,544	111,606

Method of obtaining reports

Except a few establishments visited by the committee's representative, the reports were obtained by correspondence. The Chicago Association of Commerce, through the chairmen of its various trade sub-divisions, assisted in selecting the industries to be canvassed. These chairmen were intimately acquainted with conditions in their own trade sub-divisions and were therefore able to give reliable information as to the largest establishments in their own sub-divisions and as to the firms employing the largest percentage of skilled workmen. This information was secured by the committee's representative in a personal interview with the chairmen of the sub-divisions.

[2] Omitting the 13,858 employees in the group of contractors and builders and in the one mail-order house, the remaining total number of employees represents 40.6 per cent of all employees in manufacturing industries of Chicago, according to the United States Census of 1905. Of the 18 leading manufacturing industries of Chicago, according to the 1905 Census, all are represented in this investigation except the following (numbers indicate rank in value of products): 6, steam railroad cars; 7, bakery products; 9, malt liquors; 12, coffee and spice; 15, illuminating and heating gas; 16, smelting and refining of lead.

[3] Four establishments in group 1 did not report the number of employees; also 1 in group 2, 2 in group 3, 4 in group 4, 1 in group 6, and 1 in group 8. In some of the following tables the different numbers given for the total employees in a particular industry, or grouping of industries, are explained by the fact that all establishments replying from that industry, or group, did not answer all the questions in the schedule submitted.

Each letter addressed to firms in the Chicago Association of Commerce was accompanied by an official letter from the Association urging the attention of employers to the schedule of questions. A personal letter from the chairmen of the trade sub-divisions or from other individuals closely associated with the firms addressed was also sent in practically all cases. In addition a general statement of the purpose and scope of the investigation was enclosed. The replies received represent about 55 per cent of the number of firms addressed.

General summary

To give a glance at the general results of the investigation, the replies from the 181 establishments are summarized in Tables 8, 9, 10, and 11, below. The detailed figures are presented in Tables 12 to 18, inclusive.

Table 8 shows that 41.1 per cent of the employees are in the class of low-grade or medium skill, and 27.7 per cent are in the highly skilled class. The number reported as unskilled is 31.1 per cent of the total.

TABLE 8. NUMBER OF EMPLOYEES, WITH PER CENT OF TOTAL, IN VARIOUS CLASSES, FOR ALL ESTABLISHMENTS ANSWERING THESE QUESTIONS COMPLETELY

	Male	Female	Total	Total employees in establishments answering the questions (See Note 3)	Per cent of total employees
Number under 16	530	684	1,214	99,141	1.2
Number under 18 being trained:					
(a) low-grade skill	864	784	1,648	....	2.2
(b) high-grade skill	886	274	1,160	....	1.5
Total	1,750	1,058	2,808	75,343	3.7
Number of skilled employees:					
(a) low-grade skill	29,898	6,875	36,773	....	41.1
(b) high-grade skill	22,403	2,407	24,810	....	27.7
Total	52,301	9,282	61,583	89,333	68.8
Number of unskilled employees	22,070	5,680	27,750	89,333	31.1

That few children under sixteen years of age are wanted in the skilled industries of Chicago and that few under eighteen are being trained for skilled work is shown by the following argument, assuming the firms in Table 8 to be fairly representative, in these respects, of the skilled industries of Chicago.

From Table 8 the number of children under sixteen is 1.2 per cent of the total number of employees. The population of Chicago between fourteen and sixteen years of age is more than 4.9 per cent of the total population fourteen years of age, and over.[4] The ratio of 1.2 to 4.9 is less than ¼. It is, then, safe to say that, *of the age-group fourteen to sixteen, the skilled industries employ less than one-fourth of the persons available to those industries under a normal[5] distribution of age-groups.*

Similarly, the number under eighteen being trained is 3.7 per cent of the total number of employees. The population in Chicago between fourteen and eighteen years of age is more than 9.1 per cent of the total population fourteen years of age, and over.[4] The ratio of 3.7 to 9.1 is a little over 2-5. It is, then, safe to say that, *of the age-group fourteen to eighteen, the skilled industries are training only a little over two-fifths of the persons available to those industries under a normal[5] distribution of age-groups.* This is for positions of low-grade skill as well as for positions of high-grade skill. For the latter positions alone, *the number under eighteen being trained* (1.5 per cent of the total employees) *is less than one-sixth of the persons available under a normal[5] distribution of age-groups.*

According to Table 9, 74.7 per cent of the firms report difficulty in obtaining or in training skilled employees, and 63.1 per cent report difficulty in obtaining or in training foremen.

TABLE 9. SUMMARY OF REPLIES TO QUESTIONS 2 AND 3

	"Yes"	"No"	Per cent "Yes"
Question 2	133	45	74.7
Question 3	106	62	63.1
Total	239	107	69.0

[4] Based on the school census, 1910, and on the United States census, 1900, 1910.

[5] "Normal" in the sense of corresponding to the age distribution of the total population fourteen years of age and over. The ratios would be a little over one-fourth, one-half and one-fourth, respectively, if the number of females in the groups referred to in Table 8 were equal to the number of males.

As a somewhat definite measure of the degree of difficulty experienced in obtaining skilled employees, 93.7 per cent of the firms report (Table 13, page 52) that their business could be advanced in amounts varying from 10 to 100 per cent, or more, if more skilled workers were available. Fifty-eight per cent of the firms train few or none of their own skilled employees (Table 14).

That industrial schools for the years fourteen to sixteen would be of value to the industries is asserted by 88 per cent of the firms (Table 10). The number of employees in these establishments is 101,449, or 91.9 per cent of the total. Ninety per cent, having 93,398 employees, are in favor of trade schools after the age of 16; 86.4 per cent favor evening schools.

TABLE 10. SUMMARY OF REPLIES TO QUESTIONS 4, 5 AND 6

	"Yes"		"No"		Per cent "Yes"	
	No. of establishments	Total employees therein	No. of establishments	Total employees therein	Of the establishments	Of the total employees
Question 4	148	101,449	17	8,837	88.0	91.9
Question 5	144	93,398	16	13,915	90.0	87.0
Question 6	147	....	23	....	86.4	....

It is interesting to compare the replies of Chicago employers to questions 2, 4, 5 and 6 with the replies to the same questions of nearly 900 employers in similar industries in the State of New York.[6] Table 11 shows that the percentage of employers reporting difficulty in obtaining skilled employees (question 2) is very much greater in Chicago than in New York State. The percentage of employers favoring the three types of industrial schools (questions 4, 5 and 6) is also, in each case, much greater in Chicago. Since the State of New York has deemed it necessary to establish a system of industrial schools under State subsidy, Chicago is, by comparison, somewhat backward in making provisions to meet the greater need and to respond to the more favorable attitude of employers toward industrial schools.

[6] Report of New York State Bureau of Labor Statistics, 1908, Part I, p. 14 ff. In this comparison the New York industries included are: metals, wood, printing, clothing, building. The industries omitted from the Chicago investigation are: packing houses, miscellaneous. The questions used for the comparison are the same in both investigations.

TABLE 11. COMPARISON OF REPLIES OF CHICAGO AND NEW YORK STATE EMPLOYERS TO CERTAIN QUESTIONS

	Per cent "Yes"	
	Chicago	New York State
Question 2	76.9	49.9
Question 4	90.0	79.3
Question 5	90.7	70.6
Question 6	87.5	73.3

The detailed results

Table 12 shows the supply of skilled labor and the weekly wages most frequently paid, classified by industries. The data on the supply of skilled labor are obtained from the answers to the following two questions:

Question 2. *Do you have difficulty in obtaining or in training skilled employees?*

Question 3. *Do you have difficulty in obtaining or in training employees to act as foremen or department heads?*

TABLE 12. SUPPLY OF SKILLED LABOR AND WEEKLY WAGES PAID, BY INDUSTRIES

INDUSTRY	Number answering: Question 2, Yes	Question 2, No	Question 3, Yes	Question 3, No	Weekly wages most frequently paid	Low-grade skill	High-grade skill	No. of establishments not reporting wages
Total number of establishments replying (181)								
1. Industries employing mainly women (36)[8]	30	6	19	12	[7]m.	$ 8.00–$15.00	$15.00–$30.00	9
					f.	5.00– 15.00	8.00– 24.00	
Embroidery, children's dresses, dry goods specialties (9)	8	1	5	3	m.	8.00– 10.00	15.00– 18.00	3
					f.	5.00– 9.00	8.00– 12.00	
Hats, gloves, fur goods (3)	3	....	2	....	m.	8.00– 12.00	15.00– 30.00	....
					f.	5.00– 9.00	10.00– 12.00	
Men's neckwear, shirts, hosiery, underwear (7)	3	4	1	4	m.	8.00– 12.00	15.00– 18.00	....
					f.	6.00– 8.00	10.50– 14.00	
Cloaks, suits, waists (5)	5	....	4	1	m.	10.00– 15.00	20.00– 26.00	2
					f.	10.00–	14.00– 24.00	
Factory millinery (6)	5	1	2	3	m.	15.00–	18.00– 22.00	2
					f.	6.00– 15.00	15.00– 20.00	
Paper boxes (6)	6	....	5	1	m.	9.00– 15.00	15.00– 21.00	2
					f.	6.00– 9.00	9.00– 14.00	
2. Men's clothing (9)	6	2	7	1	[7]m.	8.00– 10.00	18.00– 23.00	5
					f.	7.00– 9.00	15.00– 19.00	
Wholesale manufacturers (5)	3	2	5	....	m.	9.00–	18.00– 20.00	3
					f.	9.00–	15.00– 18.00	
Tailors to the trade (4)	3	....	2	1	m.	8.00– 10.00	19.00– 23.00	2
					f.	7.00– 9.00	17.00– 19.00	
3. Iron, steel and electrical products, conveyances (49)	35	14	28	20	[7]m.	10.00– 18.00	16.50– 22.00	9
					f.	6.00– 9.00	8.00– 11.00	
Machine and engine construction, car building, foundry, steel works, ornamental iron (21)	11	9	12	8	m.	12.00– 18.00	17.00– 20.00	5
					f.			
Electrical apparatus, gas and electric fixtures, automatic machines (9)	8	1	5	4	m.	10.00– 13.00	17.00– 22.00	....
					f.	6.00– 9.00	9.00– 11.00	
Automobiles and accessories, wagons, farm implements (19)	15	4	11	8	m.	10.50– 15.00	16.50– 21.00	4
					f.	7.25– 8.50	8.00– 10.00	

[7] Shows the lowest and the highest of the averages in this group. The letters "m" and "f" stand for male and female, respectively.
[8] The numbers in parentheses following the descriptive terms indicate the number of establishments replying.

TABLE 12. SUPPLY OF SKILLED LABOR AND WEEKLY WAGES PAID, BY INDUSTRIES — *Concluded*

INDUSTRY	Number answering: Question 2, Yes	Question 2, No	Question 3, Yes	Question 3, No	Weekly wages most frequently paid	Low-grade skill	High-grade skill	No. of establishments not reporting wages
4. Contractors and builders (17)...........	11	6	10	6	[7]m.	10.80– 17.00	16.20– 30.00	6
					f.			
General construction of buildings and electric power plants, docks (10)....	7	3	6	3	m.	13.00– 17.00	27.00– 30.00	6
					f.			
Bridge and other steel structural work (3)........................	2	1	2	1	m.	10.80– 11.40	16.20– 27.50	....
					f.			
Excavating, wrecking and roofing (4)..	2	2	2	2	m.	12.00– 17.00	23.50	....
					f.			
5. Furniture, metallic beds, office fixtures (10).............................	7	3	4	5	m.	11.00– 15.00	15.00– 19.50	1
					f.		8.00– 13.00	
6. Printing (35)........................	30	5	24	10	[7]m.	8.50– 15.00	20.00– 28.00	6
					f.	6.00– 10.00	12.00– 18.00	
Job and newspaper printing (20).....	18	2	16	3	m.	10.00– 15.00	20.00– 22.50	5
					f.	6.00– 10.00	12.00– 18.00	
Engraving, electrotyping, embossing, lithographing (15)................	12	3	8	7	m.	8.50– 15.00	20.00– 28.00	1
					f.	6.00– 9.00		
7. Jewelry manufacturing (11)............	9	2	10	....	m.	8.00– 10.00	20.00– 25.00	1
					f.	6.00– 7.00		
8. Packing houses and allied industries (7)..	2	4	2	4	m.	10.50– 12.00	15.00– 25.00	1
					f.	6.50– 12.00	7.50– 14.00	
9. Pianos and musical instruments (4).....	3	1	1	3	m.	10.50– 13.00	18.00– 19.00	....
					f.	5.50–	10.00–	
10. Miscellaneous, including one manufacturing confectionery, one wall paper mill and one mail-order house (3).....	1	2	1	1	Insufficient data..		....	....
Total for questions 2 and 3..........	133	45	106	62		....	....	....
Per cent "yes" for questions 2 and 3.........	74.7		63.1					
Lowest and highest of all the averages given..	....		....		m.	8.00– 18.00	15.00– 30.00	....
					f.	5.00– 15.00	7.50– 24.00	

The totals in Table 12 show that 74.7 per cent of the establishments have difficulty in obtaining skilled employees, and that 63.1 per cent have difficulty in obtaining foremen or department heads.

In only three of the industries do a majority of the firms answer "no" to question 2; men's neckware, etc., packing houses, and the three miscellaneous establishments. To question 3 a majority answered "no" in only five industries; men's neckwear, etc., millinery, furniture, packing houses, and pianos.

The greatest difficulty in obtaining skilled employees and foremen is found in printing, industries employing mainly women, jewelry, and men's clothing (Table 12a). The group of contractors and builders shows considerable difficulty in obtaining foremen.

Table 12a. Rank of the Industries in Table 12, by Groups

Rank of groups on question 2	Rank on question 3	Weekly wages	
		Low-grade skill	High-grade skill
1. Printing	3	m. 8.50–15.00	20.00–28.00
2. Industries employing mainly women	5	f. 6.00–10.00	12.00–18.00
		m. 8.00–15.00	15.00–30.00
		f. 5.00–15.00	8.00–24.00
3. Jewelry manufacturing	1	m. 8.00–10.00	20.00–25.00
		f. 6.00– 7.00	
4. Pianos	10	m. 10.50–13.00	18.00–19.00
		f. 5.50	10.00
4. Men's clothing	2	m. 8.00–10.00	18.00–23.00
		f. 7.00– 9.00	15.00–19.00
5. Iron and steel	6	m. 10.00–18.00	16.50–22.00
		f. 6.00– 9.00	8.00–11.00
6. Furniture	8	m. 11.00–15.00	15.00–19.50
		f.	8.00–13.00
7. Contractors	4	m. 10.80–17.00	16.20–30.00
		f.	
8. Miscellaneous	7	....	....
9. Packing houses	9	m. 10.50–12.00	15.00–25.00
		f. 6.50–12.00	7.50–14.00

An examination of the wages paid in the high-grade skilled class shows, in a general way, that the industries of higher rank on question 2 pay the higher wages for this class of employees. In the low-grade class the inverse relation predominates. It can not be said, therefore, on the basis of these reports, that the greater difficulty of obtaining skilled employees in certain industries is due to the lower wages paid.

A somewhat definite measure of the degree of difficulty experienced in obtaining skilled employees is furnished by Table 13 which gives the answers to the following question:

Question 7. *To what extent could your business be advanced if more skilled workers were available, and if greater industrial or business intelligence prevailed among foremen or department heads?*

TABLE 13. ANSWERS TO QUESTION 7, BY INDUSTRIES

INDUSTRY	Number answering question 7 by: "amazing degree" "vast" "unlimited" 100 percent or more	"very much" "greatly" 50%–100%	"some" "considerably," "materially" 10%–50%	"none"	Not answering the question
1. Industries employing mainly women (36)[9]	4	8	12	1	11
2. Men's clothing (9)	1	1	3	....	4
3. Iron, steel and electrical products (49)	2	12	20	1	14
4. Contractors and builders (17)	2	2	9	1	3
5. Furniture, metallic beds, office furniture (10)	2	1	3	....	4
6. Printing (35)	1	8	17	2	7
7. Jewelry manufacturing (11)	....	3	3	....	5
8. Packing houses (7)	....	1	2	1	3
9. Pianos, musical instruments (4)	....	....	4	....	....
10. Miscellaneous (3)	....	....	1	2	....
Total (181)	12	36	74	8	51
Per cent of total number (130) answering the question	9.2	27.6	56.9	6.1	....

The totals in Table 13 show that 93.7 per cent of the establishments answering the question believe that their business could be advanced in amounts varying from 10 to 100 per cent, or more, if more skilled workers were available; 36.8 per cent of the establishments believe that the advance would be from 50 to 100 per cent, or more.

That most employers have not trained in their own establishments all, or even a majority of their skilled employees, is shown by Table 14, which gives the replies to the following question:

Question 1. *From what source do you obtain your skilled employees — employees of high-grade skill, and of medium or low-grade skill?*

[9] The numbers in parentheses following the descriptive terms indicate the number of establishments replying.

(a) Are they trained in your own establishments? (b) Are they obtained from other sources?

TABLE 14. TRAINING OF SKILLED EMPLOYEES

INDUSTRY	Number of firms answering that of their skilled employees they train in their own establishments			
	"All"	"Majority"	"Few"	"None"
1. Industries employing mainly women (36)	6	14	11	3
Embroidery, children's dresses, dry goods, specialties (9)	....	6	1	1
Hats, gloves, fur goods (3)	....	1	2	....
Men's neckwear, shirts, hosiery, underwear (7)	1	4	2	....
Cloaks, suits, waists (5)	....	1	1	2
Factory millinery (6)	2	1	3	....
Paper boxes (6)	3	1	2	....
2. Men's clothing (9)	1	5	3	....
Wholesale manufacturers (5)	....	4	1	....
Tailors to the trade (4)	1	1	2	....
3. Iron, steel and electrical products, conveyances (49)	4	18	23	4
Machine and engine construction, car building, foundry, steel works, ornamental iron (21)	1	6	14	....
Electrical apparatus, gas and electric fixtures, automatic machines (9)	1	4	4	....
Automobiles and accessories, wagons, farm implements (19)	2	8	5	4
4. Contractors and builders (17)	1	4	6	5
General construction of buildings, electric power plants, docks (10)	1	2	2	4
Bridge and other steel structural work (3)	....	1	1	1
Excavating, wrecking, roofing (4)	....	1	3	....
5. Furniture, metallic beds, office fixtures (10)	1	1	8	....
6. Printing (35)	2	7	19	7
Job and newspaper printing (20)	2	1	11	6
Engraving, electrotyping, embossing, lithographing (15)	....	6	8	1
7. Jewelry manufacturing (11)	1	1	9	....
8. Packing houses and allied industries (7)	1	5	....	....
9. Pianos, musical instruments (4)	....	1	3	....
Total	17	56	82	19
Per cent of total number (174) of firms answering the question	9.7	32.1	47.1	10.9

The totals for Table 14 show that 58 per cent of the establishments train few or none of their skilled employees; that only 9.7 per cent train all of their skilled employees; and that 32.1 per cent train a majority. Corresponding percentages for similar industries in New York State are 59.6 per cent training few or none; 5.5 per cent training all; 33.7 per cent training a majority.[10]

The rank of the industries with respect to the percentages of firms reporting that they train few or none of their skilled employees is shown in Table 14a.

TABLE 14A. RANK OF THE INDUSTRIES IN TABLE 14, BY GROUPS

	No. of firms reporting	Per cent reporting that they train few or none of their skilled employees
Jewelry manufacturing	11	81.8
Furniture, metallic beds, office fixtures	10	80.8
Pianos and musical instruments	4	75.0
Printing	35	74.2
Contractors and builders	16	68.7
Iron, steel and electrical products, conveyances	49	55.1
Industries employing mainly women	34	44.1
Men's clothing	9	33.3
Packing houses	6	....
Total	174	58.0

That the apprentice system does not meet the need for skilled employees is shown by the investigation of 452 establishments in New York State, in industries similar to most of those canvassed in Chicago; 66.8 per cent reported that the apprentice system did not meet the need for skilled employees in their business.[11]

The industrial and social conditions responsible for the failure of the apprenticeship system to train a sufficient number of skilled employees are well set forth in the following quotation from a discussion of this question by Prof. C. R. Richards, Director of Cooper Union, New York City.[12]

[10] Report of New York State Bureau of Statistics, Part I, 1908. In this comparison the New York industries omitted are: glass, leather, textiles, cigars and confectionery.

[11] Report of New York State Bureau of Statistics, Part I, 1908. In this statement the New York industries omitted are: glass, leather, textiles, cigars and confectionery.

[12] The quotation is taken from the Report of the New York State Bureau of Statistics, Part I, 1908, pp. 24-27. Professor Richard's extensive observations give special value to his statement.

The modern organization of industry on the capitalist basis means the employment of numbers of workmen as wage earners whose sole responsibility is the forwarding of the productive tasks assigned to them. Such organization generally also means extended division of labor. It means these things whether hand power or machinery be used in this industry. In the trades where machinery is used, the value of the workman's time for purely productive purposes is increased by the added cost of machine and power. With the entire working force engaged upon production, it is no one's interest to turn aside and instruct the learner, and such instruction, if in any sense comprehensive, can be given in the direct course of production only at a certain immediate loss.

Under these conditions, the employer of to-day, drawing his workmen from the general labor market, that in some cases is largely fed by immigration, no longer feels the same individual necessity and responsibility for the training of beginners and hesitates to assume the cost and inconvenience of such a provision. The maintenance of a thorough apprenticeship system having become exceptional, imposes in a sense a penalty upon the manufacturer who undertakes it, inasmuch as he has no guarantee that apprentices will remain in his employ. Furthermore, the great subdivision of labor that characterizes all modern industries on a large scale imposes peculiar difficulties in the way of a thorough and comprehensive training, inasmuch as such a training involves a shifting of the apprentice from one branch to another that lessens his productive value. All these conditions make the employer slow to assume the trouble and expense of a thorough apprenticeship system. The tendency is more and more to place the beginner upon certain special branches at the tools and let him develop as quickly as possible into a productive unit.

On the other hand, as pointed out above, the journeyman under ordinary conditions has no interest or advantage in the training of an apprentice. His first consideration is, of necessity, his own wages, and especially in those industries that are upon a piece-work basis, the journeyman has no time for teaching; furthermore, he is apt to look upon the apprentice as a future rival who will add to the supply of skilled workers and reduce his own chance of employment.

Another difficulty, and a very large one, that faces the apprenticeship question is the unwillingness of the American boy to submit to a long period of training at low wages for the sake of future opportunities. The tendency of the American boy is toward a short cut; he resents the rules and restrictions of the apprenticeship period and turns to openings that yield larger immediate returns. That this attitude is justifiable and natural in many cases where the so-called apprentice is given practically no assistance toward attaining a really broad training, and where he is left largely to chance and his own initiative to pick up anything more than the rudiments of a trade, must be conceded. This attitude is only removed when the apprentice feels that his interests are being cared for and a systematic effort is being made to open up a future worth working for. That it is removable is satisfactorily shown in those instances where provision is made for systematic training and technical instruction on the part of the employer.

Another cause that holds back a bright boy from the apprenticeship is the low wages paid. Whereas the journeyman's wage has been advanced in most of the skilled trades under the influence of organization, the wages of the apprentice have not advanced in proportion to the demand for young men in the industries. Organized labor, with its mind almost solely upon the advancement of the standard of living, and the employer, with his mind almost solely upon the increase of profits, have neither been concerned to advance the wage of the apprentice, and with no influence to press them upward these wages have remained extremely low.

Owing to these many conditions, apprenticeship in the sense of a broad and thorough training of the first-class workman has given place in many establishments and in many of the industries where it formerly prevailed to a so-called apprenticeship that trains in only a narrow range of work and fits only in some special line of skill. In such apprenticeship systems the period of training is much shorter than in the older form and very often no age restrictions are imposed. Such systems figure to quite an extent in . . . the machine woodworking trades, in the manufacture of gas and electric fixtures, in some branches of boot and shoe manufacture, in garment making and in the manufacture of cigars.

The helper system is another important channel through which beginners enter the skilled trades. The helper takes various forms in the various trades, but in general he supplies the relatively unskilled help needed to carry forward the work of the skilled journeyman. In some industries, as in certain of the building trades, he appears as an unskilled mature laborer that rarely advances to the grade of a skilled worker. In others he is represented by a younger class, below the journeyman, called juniors, improvers or helpers, who may be in regular succession to the skilled positions. In other cases, as in the machine shop, the helper is a "handy man" who performs odd jobs and in general the less skilled kinds of work such as finishing and filing. Such helpers have an opportunity to watch the operations of the journeyman and to become acquainted with his work, and where the conditions admit, the brighter and more progressive advance to the positions of skilled workmen.

One other general method under which skilled workers for the industries are recruited applies more or less to all industries in which great division of labor obtains. In such industries beginners are generally put at first at the simpler operations, and as they show ability and application are advanced to somewhat more difficult processes or the manipulation of less simple machines. This advancement may continue up to that particular point in the organization beyond which the capacities or ambition of the worker are not sufficient to carry him. This system of developing skilled workers obtains in most women's trades, such as clothing, millinery and laundries, in the boot and shoe manufacture and in textile mills, and is found more or less combined with other systems of training in all other industries where much division of labor obtains.

Table 15 shows the attitude of employers on industrial schools, as revealed by the answers to the following three questions:

Question 4. *Would the efficiency and future opportunities of your employees be increased if they received a training between the ages of fourteen and sixteen in a general public industrial or preparatory trade school which aims to give a knowledge of materials, shop mathematics, and fundamental industrial methods, and some idea of industrial organization, but does not teach a special trade?*

Question 5. *Would practical day trade schools, giving a specialized and intensive training of one year or more after the age of sixteen, help to meet the problem of skilled employees in your business?*

Question 6. *Would practical evening or half-time trade schools be of value in helping unskilled workers, or those of low-grade skill, to advance to positions requiring high-grade skill?* (Remark. Question 6 was interpreted by practically all employers to refer to evening schools only.)

Table 15. Replies to Questions Concerning Industrial Schools, by Industries

Industry	Question 4				Question 5				Question 6	
	Yes		No		Yes		No		Yes	No
	No. of establishments	Total employees therein	No. of establishments	Total employees therein	No. of establishments	Total employees therein	No. of establishments	Total employees therein	No. of establishments	No. of establishments
1. Industries employing mainly women (36)[13]	29	5,201	3	482	27	5,067	3	507	27	5
2. Men's clothing (9)	5	2,465	1	1,400	6	3,865	......	......	8	......
3. Iron and steel (49)	44	53,236	2	741	45	45,347	2	8,630	45	4
4. Contractors and builders (17)	12	5,178	1	180	12	5,178	1	180	14	3
5. Furniture, metallic beds, office fixtures (10)	9	4,446	1	240	7	2,055	1	450	8	1
6. Printing (35)	27	2,964	7	2,125	26	3,800	7	659	25	7
7. Jewelry manufacturing (11)	11	397	......	......	10	380	......	......	9	......
8. Packing houses (7)	5	18,189	1	3,500	5	18,189	1	3,500	6	1
9. Pianos and musical instruments (4)	3	1,073	1	169	4	1,242	......	......	4	......
10. Miscellaneous (3)	3	8,300	......	......	2	8,275	1	125	1	2
Total	148	101,449	17	8,837	144	93,398	16	13,915	147	23
Per cent of number of establishments answering "yes"	88.0	......	......	......	90.0	......	......	......	86.4	......
Per cent of total employees in establishments answering "yes"	......	91.9	......	......	......	87.0	......	......	......	......

[13] The numbers in parentheses following the descriptive terms indicate the number of establishments replying.

The rank of the industries, in the order of the per cent of the number of establishments answering "yes" to questions 4 and 5 is as follows:

TABLE 15A. RANK OF THE INDUSTRIES IN TABLE 15

Rank on question 4	Rank on question 5
1. Jewelry	1
1. Miscellaneous	8
2. Iron, steel	2
3. Contractors	3
4. Industries employing mainly women	4
5. Furniture	5
6. Men's clothing	1
6. Packing houses	6
7. Printing	7
8. Pianos	1

Table 16 gives the number of employees of medium or low-grade skill, the number of high-grade skill, the total number of employees, and the per cent of the total force in the two skilled classes.

TABLE 16. NUMBER AND PER CENT OF SKILLED EMPLOYEES, BY INDUSTRIES

INDUSTRY	Number of skilled employees					Total employees in establishments answering the questions		Per cent of total force in skilled classes
	Low-grade skill		High-grade skill		Total both classes			
	Male	Female	Male	Female		Male	Female	
1. Industries employing mainly women (26)[14]	330	1,372	366	761	2,829	1,144	3,256	64
Embroidery, children's dresses, dry goods specialties (6)	55	361	100	196	612	213	548	80
Hats, gloves, fur goods (3)	25	52	27	48	152	55	115	89
Men's neckwear, shirts, hosiery, underwear (6)	14	22	74	309	419	128	600	57
Cloaks, suits, waists (3)	56	80	51	28	215	149	195	62
Factory millinery (4)	8	55	74	117	254	105	650	33
Paper boxes (4)	172	902	40	63	1,177	494	1,148	71
2. Men's clothing (3)	154	153	566	292	1,165	720	445	100
Wholesale manufacturers (2)	150	150	430	180	910	580	330	100
Tailors to the trade (1)	4	3	136	112	255	140	115	100
3. Iron, steel and electrical products and conveyances (42)	22,679	4,356	10,784	491	38,310	42,430	4,856	81
Machine and engine construction, car building, foundry, steel works, ornamental iron (18)	3,697	25	5,960	6	9,688	17,731	33	54
Electrical apparatus, gas and electric fixtures, automatic machines (9)	7,223	3,002	2,389	318	12,932	9,685	3,319	99
Automobiles and accessories, wagons, farm implements (15)	11,759	1,329	2,435	167	15,690	15,014	1,504	94
4. Contractors and builders (10)	1,329	....	1,588	8	2,925	3,176	32	91
General construction of buildings, electric power plants, docks (3)	1,117	....	1,175	....	2,292	2,292	2	99
Bridges and other steel structural work (3)	169	....	375	....	544	780	....	69
Excavating, wrecking, roofing (4)	43	....	38	8	89	104	30	66

TABLE 16. NUMBER AND PER CENT OF SKILLED EMPLOYEES, BY INDUSTRIES — *Concluded*

INDUSTRY	Number of skilled employees					Total employees in establishments answering the questions		Per cent of total force in skilled classes
	Low-grade skill		High-grade skill		Total both classes			
	Male	Female	Male	Female		Male	Female	
5. Furniture, metallic beds, office fixtures (9)	723	....	2,754	253	3,730	3,880	356	88
6. Printing (32)	670	416	2,545	450	4,081	3,715	1,088	84
Job and newspaper printing (18)	396	278	1,812	428	2,914	2,424	779	90
Engraving, electrotyping, embossing, lithographing (14)	274	138	733	22	1,167	1,291	309	72
7. Jewelry manufacturing (9)	71	115	71	1	258	261	118	68
8. Packing houses and allied industries (5)	3,330	388	2,282	127	6,127	13,411	1,028	42
9. Pianos and musical instruments (4)	487	50	622	24	1,183	1,164	78	95
10. Miscellaneous, including one manufacturing confectionery, one wall-paper mill and one mail-order house (2)	125	25	825	....	975	4,470	3,705	11
Total	29,898	6,875	22,403	2,407	61,583	74,371	14,962	....
Total, male and female	36,773		24,810		61,583	89,333		68.9
Per cent of total force in each skilled class	41.1		27.7					

[14] The numbers in parentheses following the descriptive terms indicate the number of establishments replying to the questions concerned in this table.

The totals for Table 16 show that 68.9 per cent of the employees are in the two skilled classes, only 27.7 per cent, however, in the high-grade skilled class.

The rank of the ten groups of industries with respect to the percentage of employees in the highly skilled class is given in Table 16a.

TABLE 16A. RANK OF INDUSTRIES WITH RESPECT TO PERCENTAGE OF EMPLOYEES IN HIGHLY SKILLED CLASS

	Per cent in highly skilled class	Total employees in establishments answering these questions
1. Men's clothing[15]	73	1,165
2. Furniture	70	4,236
3. Printing	62	4,803
4. Pianos	52	1,242
5. Contractors	49	3,208
6. Industries employing mainly women	25	4,400
7. Iron, steel	23	47,286
8. Jewelry	19	379
9. Packing houses	16	14,439
10. Miscellaneous	10	8,175
Total	27	89,333

Table 17 gives the number and per cent of employees under eighteen years of age being trained for positions of medium or low-grade skill, and for positions of high-grade skill.

[15] Of the 9 firms in this industry replying to the committee's letter, only 3 firms answered the questions here involved.

TABLE 17. NUMBER AND PER CENT OF EMPLOYEES UNDER 18 BEING TRAINED

INDUSTRY	Number under 18 being trained					Total employees in establishment answering the questions	Per cent of total force
	Low-grade skill		High-grade skill		Total both classes		
	Male	Female	Male	Female			
1. Industries employing mainly women (24)[16]	55	584	29	98	766	4,240	18.0[17]
2. Men's clothing (3)	27	10	15	....	52	1,155	4.5
3. Iron, steel and electrical products (41)	418	33	360	....	811	47,286	1.7
4. Contractors and builders (11)	100	....	18	....	118	3,208	3.6
5. Furniture, metallic beds, office fixtures (9)	36	2	106	40	184	4,236	4.3
6. Printing (32)	124	83	248	50	505	4,173	12.1[18]
7. Jewelry manufacturing (9)	2	6	11	....	19	379	5.0
8. Packing houses (4)	81	50	85	75	291	9,424	3.0
9. Pianos and musical instruments (4)	21	16	14	11	62	1,242	4.9
Total	864	784	886	274	2,808	75,343	3.7
Total of male and female	1,648		1,160		....		....
Per cent of total force in each skilled class	2.2		1.5		....		....

[16] The numbers in parentheses following the descriptive terms indicate the number of establishments answering the questions concerned in this table.

[17] This large per cent is due mainly to the returns from one firm, manufacturing paper boxes, which reports 400 girls under eighteen years being trained for work of low-grade skill out of a total of 700 women employed in that class.

[18] This large per cent is due mainly to the returns from one printing establishment, which reports an apprenticeship system with 145 boys and girls under eighteen being trained for work of high-grade skill out of a total of 740 employees in that class. See page 142 for a description of this apprentice school.

The totals for Table 17 show that the number of employees under eighteen years of age being trained for positions in the two skilled classes is 3.7 per cent of the total working force. For the highly skilled class the number is 1.5 per cent of the total force.

Table 18 gives the number and per cent of employees under 16 years of age.

TABLE 18. NUMBER AND PER CENT OF EMPLOYEES UNDER 16

INDUSTRY	Number of employees under 16			Total employees in establishments answering the question	Per cent of total employees
	Male	Female	Male and Female		
1. Industries employing mainly women (31)[20]	40	357	397	5,383	7.3[19]
2. Men's clothing (8)	71	164	235	5,087	4.6
3. Iron, steel and electrical products (46)	24	......	24	49,285	0.0004
4. Contractors and builders (13)	......	......	......	5,358	0.0
5. Furniture, metallic beds and office fixtures (10)	49	......	49	4,686	1.0
6. Printing (34)	185	111	296	5,089	5.8
7. Jewelry manufacturing (11)	2	6	8	397	2.0
8. Packing houses (5)	11	......	11	14,439	0.0007
9. Pianos and musical instruments (4)	16	11	27	1,242	2.1
10. Miscellaneous (2)	132	35	167	8,175	2.0
Total	530	684	1,214	99,141	1.2

Recapitulation

The number of children under sixteen years in Chicago's skilled industries is almost zero, just above one per cent. These children are receiving no training. The industries that are giving any sort of training for high-grade skill affect only one-sixth of the group of children between fourteen and eighteen, and for both low-grade and high-grade skill the industries are training only two-fifths of the children of that age.

Three-fourths of the firms replying find difficulty in obtaining or training skilled employees, and a little lower percentage report

[19] This large per cent is due mainly to the returns from one firm, manufacturing paper boxes, which reports 250 girls and 15 boys under sixteen years of age, out of a total force of 800 females and 200 males.

[20] The numbers in parentheses following the descriptive terms indicate the number of establishments replying to the questions concerned in this table.

difficulty in training or obtaining foremen; nearly sixty per cent of the firms train few or none of their own skilled workmen.

Practically all admit that their business would be advanced if more skilled workers were available. For this reason nearly ninety per cent believe that industrial schools of different types for the years between fourteen and eighteen would be of value to their concerns.

The percentage of employers in Chicago finding difficulty in obtaining skilled laborers is greater than those reporting in the New York State inquiry, and a larger percentage favor industrial schooling of different types.

The indication of this report is that the firms which feel the need of more skilled labor are offering higher wages, so that the scarcity of skilled labor is not due to relatively low wages. Referring to the New York report we find that nearly seventy per cent of the firms replying stated that the apprenticeship system does not meet the need for skilled employees. What is true in New York in this respect is true in Chicago.

Beyond question Chicago's industries need and demand industrial training during the years when that training can be profitably given, that is during the years between fourteen and eighteen, and this need is being met neither by the industries themselves, nor by the apprenticeship system, nor as yet by the schools.

Comments of individual employers

The schedule of questions submitted to employers contained the statement that suggestions would be welcome on any of the questions or on the general subject. In response to this statement, the following comments were received. All the comments, which were of significance one way or another, are here included, classified by industries.

A. Industries employing mainly women

1. We employ about 300 girls in our factory here and have difficulty at times to obtain sufficient trained operators. We believe an industrial school *for girls* would be a great help to manufacturers here. We would go further, and recommend that commercial training schools for boys and girls be established. It is becoming more difficult all the time to obtain sufficient and efficient office help. We think it would be a very valuable thing to have schools for both purposes, for the office as well as for the factory. In some of the foreign countries the trade schools are a great help, not only to the merchants but to the young men who are obliged to attend them.

2. We find that not being able to get girls and boys at fourteen to work in our shop we are shut out of their efforts at a time in life when they are most susceptible for the grasping of the details of business and readily learn what is required. But at sixteen the young employee has not benefited by the last two years in school and his mind is full of little things that detract from his application and ofttimes he is downright bad at heart and cannot or will not apply himself to his work with an idea of making a success of same. Usually the first question asked by a boy of sixteen is the amount of wage he is to receive, and if same seems to be sufficiently large to cover his fancied needs he will accept the position without any regard to whether he cares for the kind of employment or any desire to become a skilled fur worker.

This holds more with boys than girls, but think both would be greatly benefited if they could be put to work at fourteen years in clean, sanitary, high-class workshops under just and upright employers.

3. We have great trouble in obtaining skilled employees, and owing to this we were compelled to open branches in other cities.

A practical trade school for boys and girls sixteen years of age would be the greatest help to become artists in our line, for which there is a great field. Enlightenment of any kind will advance positions very materially in our line.

4. The only way in which we see an industrial training in the public schools could directly benefit the cloak and suit trade would be to teach the girls how to handle a needle, as it is surprising the number we get who do not know the first rudiments of sewing.

We believe, however, anything which tends to give a practical and industrial education is a good thing for manufacturing trade in general.

B. Men's clothing

1. We educate the people who come to us to sew; we educate pressers, button-hole makers, cutters and, in fact, employees in every department of manufacture. Very few of these people have had any other education except a few years in the graded public schools.

There is some difficulty in obtaining the right class of men to act in executive capacities, such as foremen and heads of tailoring shops. For example, we have offered excellent opportunities in these positions, but before a man can competently manage a shop he must first become a tailor. The man of college education will not undertake it, for he considers the form of work necessary for his practical education to be beneath his dignity. The men who are now filling the positions of foremen and superintendents are those who have graduated from the ranks of the practical workman without other education than that received from us in the shops where they were previously employed.

We believe in industrial education and are convinced that the efficiency and opportunities of employees are greater if they are schooled between the ages of fourteen and sixteen. People who have not had any education do not rise, except in rare cases, above mediocrity. With further education they will undoubtedly rise much higher on the average.

2. There can be no question about the great benefit our industries would derive from trade schools, combined with elementary schools for boys and girls, such schools to take up the studies which the graduates from the grammar schools receive in the first year of the high school. This would take in the boys and girls from fourteen to sixteen years, the average age when they complete the grammar grades.

Separate trade schools, in my opinion, should be established for each particular industry, superintended by a board of directors composed of manufacturers in that branch of industry and managed by one or more good, practical foremen, such foremen to be paid a fair salary, and the expenses of the school to be met by annual contributions of the manufacturers in that branch of industry. The tailoring industry would give all possible assistance.

In view of the fact that, in many instances, these boys and girls of fourteen to sixteen years of age contribute to their own support, or that of the family, the foreman, with the consent of the board of directors, may allow the advanced pupils to be paid for work done which may be sent in by the manufacturers, provided, however, that such work shall in no case interfere with the elementary studies.

C. Iron and steel products

1. We have also 500 men in Fitchburg, Massachusetts, and carry on and support special training two weeks alternating in shop and high school. System has been tried one year and is liked very much.[21]

We are moving away from Chicago on account of our difficulty in securing skilled employees.

2. In over twenty years, we have had a great many college men in our employ. Very few of them, however, remained. It was too slow a process for them to work in and become a part of our organization. The plan of giving alternate weeks to factory work and college study comes pretty nearly being ideal. The boys accomplish nearly as much in study as if they had given all their time to it, and when they get through they are not suffering from the enormous handicap of having the wrong point of view. The boys we are using on this plan[22] are very useful in the factory, and I foresee much greater usefulness from them as time goes on. They are getting science with practice, and avoid the monotony of too much of either. I believe the scheme is the best that has yet been proposed, and that the boy who makes his way through a technical institute on this plan will have found an exceedingly pleasant and profitable way, which gives great promise for the future.

3. The trade school would help, but the coöperative shop and school course, as introduced by National Metal Trades Association three years ago, would be better, giving "commercial" conditions.

4. We have tried a great many experiments with boys and young men in our plant, and, with possibly two exceptions, they have all been more or less failures.

[21] For Fitchburg coöperative plan, see p. 208.

[22] The Lewis Institute Coöperative Course.

We have noted that with the advent of moving picture shows, pool rooms and other amusement enterprises, there is a large field for young fellows to pick up a lot of fairly easy money. Of course their experience prevents them from seeing that these positions are at the best temporary, and do not tend to building them up for a solid business future. The result is that the average young man gets disgusted in a business that offers but a few dollars a week to start, and we are, therefore, up against the proposition of constantly changing our help.

We tried out the Lewis Institute experiment very thoroughly last year with three or four boys and they all fell down.

We think that the trouble goes back a little further than to the boys' schooling. A large percentage of them make very bad starts right in their own homes.

5. In one of our plants in another city we have made it a practice for many years, to secure at least a few of the graduates of the Williamson Training School each year.[23] These boys are started at $12 a week, which is considerably more than they are worth, to begin with, but they demonstrate very quickly the value of their preparation, and furnish us material, not only for the higher classes of machine and pattern work, but also for sub-foremen and foremen. One advantage of the training which the boys in the Williamson School receive is, that it develops no false ideals, and when the boys graduate they look for their future in the shop, and are willing to take their chances as greasy-handed mechanics.

It has been my experience that many of the graduates of schools that really are no better than trade schools feel themselves too good to be mechanics, and look for advancement in the drafting room, and other of the white collar departments.

At Chicago, at the present time, we are availing ourselves of a special course provided by the Lewis Institute, and four of our boys spend alternate weeks at the Institute. We have found it a little difficult to keep these boys interested, and if this system fails, it is because it will be difficult to keep up the boys' interest when part of the time is spent in the shop, and part at school.

The difficulty of getting promising material in Chicago is very much larger than it is in the East, and we should be very glad to coöperate in any manner to assist in training boys at the critical age, so that they may become efficient members of the craft.

6. We have four boys at Lewis Institute, two alternating each week. We also are starting an instruction school to make our men better all-around mechanics for future use in the general work of our product.

7. Yes, we have difficulty in obtaining and in training skilled employees, mainly because of their lack of fundamental education and inability to properly plan their work.

8. Trade schools would not help unless there were mathematics and mechanical drawing connected with such a school, because in the average shop where they go to learn their trade, they get the practical training in

[23] See p. 190.

the use of tools and machinery, and I believe such training is better, and more thoroughly given in the shop than it can be in the average school.

9. Trade schools would not help, because we think they had better start to work at sixteen; otherwise they do not want to commence at the bottom and so would not learn the trade thoroughly.

10. Yes, it is hard to get a skilled mechanic to act as foreman; they hate to assume the responsibility.

11. Our experience has been that the young men of the city who come here from the public schools have little or no idea of industrial methods or of shop practices and we believe that if these young men were given some mechanical training they would be in a far better position to develop themselves or at least be more susceptible to our training in actual manufacturing work.

If there were such a day trade school which would supplement the work of the higher grammar grades and first grades of high school it would to a very great extent help in supplying the demands for skilled workmen and would in our judgment greatly facilitate the power of development in young men, placing them where they would be able to attain positions of greater trust and importance. We find that those young men who have had opportunity to give even a short time to any of the few manual training schools now in existence in this city develop much faster in our business and can be used in a greater variety of positions by the fact of having this manual training education. Many young men start in manufacturing plants and learn just one operation, such as running a drill press or a milling machine, etc., or learn one line of bench work, but cannot help themselves because of a lack of efficiency and of ambition, due to an inability to read specifications and interpret blue prints, thus being barred from high grades of work and from executive positions in the manufacturing world.

The practical evening trade schools are of considerable importance and do a great deal of good, but do not in any way provide a sufficient number of semi-skilled young men to fill positions of importance in our works. If the number of these trade schools could be increased, they could in a great way assist in supplying the large demand for help of this kind.

12. Our contracts with the labor unions require us to give the officials of each union the opportunity to furnish each new man for the craft controlled by each respective union. We are required to give union officials from twenty-four to forty-eight hours notice before a man is hired. If they do not furnish a man in that time we are privileged to secure him elsewhere, provided that he is willing to join the union, or else we must dismiss him as soon as the union is able to furnish a man.

We have the privilege of rejecting men proffered by the union whom we consider to be undesirable, but on the other hand are frequently inconvenienced because of our not being able to get men on account of their unwillingness to join the union, and in some cases because of the unions not being willing to admit them into their organizations. This tends to keep a great many high grade men out of our factory who might otherwise be employed. Many union men are decidedly high grade, but there are also many who are

very medium to whom we must pay high wages in order to obtain sufficient men to turn out our work.

In some departments we are not allowed by the unions to use the apprentices on work which really teaches them anything.

It is difficult in departments which are unionized to take a man from the ranks and make him a foreman, because of the labor unions. All gang bosses and assistant foremen and inspectors must be members of the union and it is rather difficult for a man in these positions, from which the foreman should be drawn, to be sufficiently loyal to the company to secure a promotion to the position of foreman, without incurring the disfavor of his fellow members in the union.

The training in a trade school should not be so intensive that it will lower the boy's ideals and make him anxious to use what he has learned to make as much money as possible right away instead of simply using it as a guide to obtain more experience and deeper knowledge, with the expectation of being paid therefor in later years.

D. Contractors and builders

1. There is room for vast improvement in the skilled workmen and the main trouble lies in the fact that there is no apprentice law governing the length of time for serving in any trade. Most of the boys now learning trades in the building line are sons of men now at the trade and it is their aim to get their sons in possession of a membership card in order to get the higher wages, without serving the apprenticeship necessary to make them a finished mechanic. Consequently they never get to be more than a rough workman, as they have reached as high a standard as they seem to care to attain, which is the scale demanded by the union.

In regard to the trade schools would say that this has been tried by the contractors in my line before, and we found great difficulty in getting the boys to attend. I think the same amount of time spent in actual attendance of the work in the trade they wish to follow would prove to be much better than that spent in a trade school.

2. But while we have a well organized and efficient corps of the skilled employees needed in our tugging, dredging and other marine and sub-marine work for which we are contractors, our experience is that there is a noticeable lack of younger skilled men coming along in these lines, practically all of which, as well as all other labor lines covered by our requirements, are strongly unionized.

And this scarcity of these younger skilled men our observation leads us to believe is largely attributable to a disposition on the part of the older mechanics to afford the younger ones little opportunity and aid in acquiring the experience requisite to the acquisition of the degree of ability of the elders.

3. We need foremen who have a better general education and a wider outlook.

4. There is a movement on foot at this time by the Electrical Workers to instruct their men more carefully in several branches of the electrical business, they having purchased instruments, switchboard and testing appa-

ratus, which cost something over $1,000, and they are requiring their membership to go to certain set meetings and be instructed and to listen to lectures on different branches of the electrical work, as could be covered by the apparatus which they have furnished, all of which we think is going to be of material benefit to our men, and if a school as suggested by you were to be established, and we could persuade the men to go, it would be one of the best things possible to do.

5. We have no right to expect others to train our help for us, and if each employer would give time and assistance to train his own help, we would have all that would be required.

6. The writer believes it is more important for a young man to realize early in life his responsibility as a future citizen, than it is to get a lot of information out of books. There is a time in the life of every boy, when he wants to be a man, and do a man's work; if this ambition is provided for at *that* time, he becomes a good citizen; but, if by laws or otherwise, it is defeated, it is uphill work to get the habit later on.

E. Printing

1. A child should be in school at this age (fourteen to sixteen). Our schools should teach elementary trade work, thereby teaching the child toward work, instead of away from it, as now.

2. No. Such a school (preparatory trade school, fourteen to sixteen years) would be likely to make the boy careless and indefinite. Such a school should be a *special* trade school, teaching a definite trade a part of the time.

3. The *union* scale kills competition in skill as all receive practically the same wage for a given department.

4. The vital point of the whole matter is that where labor unions control a trade or control individual offices they will not allow enough apprentices to be instructed to take care of the ordinary demands of that trade, and they will not take into their unions men who have received instruction otherwise than as the apprenticeship conditions of the different unions provide.

While a theoretical knowledge of general mechanics from the ages of fourteen to sixteen will be of decided benefit to anyone wishing to learn a trade, the good workmen in all trades are produced from men who acquire their trade in a shop in actual practice, and good workmen generally are made from those who were obliged to earn their living at an early age and have never had the opportunity of attending any trade or technical schools after they are sixteen years of age.

5. As a rule the union supplies inferior men, because good workmen are usually steadily employed.

6. It would be a godsend to the printing business to have a school where boys and girls could be taught the business.

7. The labor question is the sore thumb of our business.

F. Jewelry manufacturing

1. Hardly one workman in ten has the skill and taste required for high-grade work. Yes, surely, such a school (fourteen to sixteen) would help. Switzerland, Germany and France have attained high rank for their *artisans.*

Their workmen are more than mechanics through schools for their early training. Training in drawing, modeling, etc., developing the artistic taste, would prepare them for the factory, or shop, where they get the mechanical training.

Our trade has depended on Europe for skilled workmen. The time has come when we should train them, or we will suffer a lack. We do now. In the busiest season we are much behind our opportunities on this account.

Analysis of the comment of individual employers

While there is considerable difference of opinion here, there are certain uniformities that should be noted.

In the first place there is a general recognition that present schooling has little or no relation to industrial occupations, that in the case of many if not most of the children of Chicago who enter these occupations, it has failed to give standards of efficiency or even adequate general intellectual training.

In the second place there is a general recognition that occupational training in whatever form it is given should be in close relation to trade and shop conditions.

In the third place it is quite widely recognized that in present industry the shop alone can not give adequate trade training, because work is so highly specialized and does not acquaint the apprentice with all processes, thus failing to produce all-round workmen and those who can and are willing to take the positions and responsibilities of foremen.

Finally it is evident that the causes of disagreement between employers and organized operatives make it very difficult if not impossible for them to properly standardize the training of apprentices. Clearly the one who suffers most from this situation is the child who does not receive, during the apprenticeship years, the intellectual and occupational training which he needs.

It seems evident that if the demands of industry both on the side of the employer and on that of the employed, and at the same time the interests of the child be properly safe-guarded, the shop with its methods must be taken into the school, and that this reconstructed school must set the standards with an eye single to the future of the child, and unbiased by the immediate economic interests of the employer and the union.

CHAPTER IV

ATTITUDE OF ORGANIZED LABOR IN CHICAGO AND IN OTHER CITIES

The very favorable attitude exhibited by the Chicago Federation of Labor on the question of industrial education under public auspices [see pages 74-80] should dispel all misgivings as to the possibility of serious hostility on the part of organized labor in Chicago to carefully considered provisions for industrial education in the public schools, provisions which recognize the interests of labor and arrange for the representation of labor in the conduct of such schools. Indeed, it is safe to assume, from these results and from the experience of other cities, that organized labor in Chicago would readily coöperate in an intelligent way with the public-school authorities. This is still further indicated by the coöperation already given by unions of carpenters and masons in Chicago with the Apprentice Schools in operation since 1901.

In general it may be said that abundant evidence[1] exists to show that organized labor throughout the country is not hostile to industrial education of the right kind. Labor is opposed to industrial schools conducted for private profit and providing narrow and superficial training, and to those controlled by employers and conducted solely for the employers' interests and in opposition to labor's interest. But to public schools which seek the coöperation of organized labor and employers alike, and take both into full confidence, which provide thorough and practical all-around instruction, organized labor is not only not opposed but gives its strong approval and coöperation.

In the case of all industrial schools in other cities visited by the committee's representative[2], special effort was made to find out from the school authorities what attitude was taken toward the

[1] Report on Industrial Education, American Federation of Labor; Report of Bureau of Labor Statistics, New York State, 1908, Part I; Annals of American Academy of Political and Social Science, January, 1909; Dean: *The Worker and the State;* Bulletin No. 6, National Society for Promotion of Industrial Education.

[2] See Chapters VI and VII.

schools by organized labor in the community. In only one case was any opposition reported, and that was in connection with a private school largely supported by employers' associations. Nor is the attitude of organized labor in these cities a purely negative one, resulting from lack of information or interest, for, in the case of practically all the public industrial schools visited, labor bodies are either represented on advisory committees, or have considered plans and curricula submitted by the authorities for criticism and advice. In Boston an official investigation of industrial schools, covering a week's time, was made by a representative of the Massachusetts State Branch of the American Federation of Labor, and a most favorable report was returned.

Attitude of the Chicago Federation of Labor

The following account of the attitude of the Chicago Federation of Labor is taken from the report of its Committee on Schools. Since the total membership of the Chicago Federation is about 225,000[3], and since 52.8 per cent of the 214 affiliated local unions answered the committee's questions, the results may be said to represent the attitude of more[4] than 118,800 members.[5] In the committee's letter to the affiliated unions special attention was called to the fact that the questions referred to public schools, which were designed not to turn out finished mechanics, but to lay a foundation and to give "all-around" training which will make rapid advancement possible when actual trade work is begun.

The Committee on Schools of the Chicago Federation of Labor sent the following three questions to the 214 affiliated unions:

1. Do you favor a *public* industrial or *preparatory* trade school which would endeavor to reach boys and girls between fourteen and sixteen, that now leave the common school in very large numbers before graduation? *Such a school would not teach a trade,* but would give a wide acquaintance with materials and fundamental industrial processes,

[3] Statement of a member of the Federation Committee.

[4] In the opinion of a member of the Federation Committee, the replies received were from the larger affiliated local unions.

[5] In practically all cases the answers were obtained by a vote of the local union, or by action of a special committee. The letters sent by the Federation Committee were stamped with the official seal of the Chicago Federation of Labor, and the replies received were stamped with the official seal of the affiliated local unions. The Committee on Schools acted under a resolution of the Federation authorizing the investigation. The results were reported, as here given, to the Federation in meeting assembled, and were accepted by unanimous vote and ordered published. The report, therefore, represents the official action of the Chicago Federation of Labor.

together with drawing and shop mathematics, with the object of giving a better preparation for entering the industries at sixteen and better opportunities for subsequent advancement?

2. Do you favor *public trade* schools for boys and girls between sixteen and eighteen, that would give two years of practical training, together with drawing and mathematics, *provided* the graduates of such schools should serve two years more as apprentices or improvers?

3. Do you favor public *evening* industrial schools giving instruction as indicated in questions 1 and 2, and furnishing also *supplemental* trade education for those already at work in the trades during the day?

Questions 1 and 2 are the same questions, word for word, that were sent by the New York State Department of Labor to 2,451 unions in the State of New York.[6] A comparison can therefore be made, on these two questions, between the attitude of organized labor in Chicago and the attitude of organized labor in the State of New York.

In the letter sent by the Committee to the Chicago local unions, quotations were made from the Report on Industrial Education by the American Federation of Labor, a copy of which was sent to each local union. A second and a third letter were sent to those local unions which did not reply to the first or second letter. In the second and third letters no reference was made to the report of the American Federation of Labor. In all, 117 replies were received which represent 54 per cent of the total number of affiliated local unions. Four of the unions replying did not answer the questions.

The following table shows the number of replies received to each question, the number answering "yes," the number answering "no," and the per cent answering "yes":

TABLE 19.—REPLIES FROM CHICAGO UNIONS

	Number replying	Number answering		Per cent "Yes"
		"Yes"	"No"	
Question 1	111	92	19	82.8
Question 2	112	88	24	78.5
Question 3	112	97	15	86.6
Total	335	277	58	82.6

Table 20 gives the replies to questions 1 and 2 from New York State unions, and Table 21 compares these replies with the replies from Chicago unions to the same two questions.

[6] Report of Bureau of Labor Statistics, New York State, 1908, Part I.

TABLE 20.—REPLIES FROM NEW YORK STATE UNIONS

	No. of unions replying	Number answering[7]		Per cent "Yes"
		"Yes"	"No"	
Question 1	1,877	1,523	354	81.1
Question 2	1,877	1,303	574	69.4
Total	3,754	2,826	928	75.2

TABLE 21.—COMPARISON OF REPLIES FROM CHICAGO UNIONS WITH REPLIES FROM NEW YORK STATE UNIONS

	Per cent "Yes"	
	Chicago unions	N. Y. State unions
Question 1	82.8	81.1
Question 2	78.5	69.4
Total	80.7	75.2

The per cent answering "Yes" is in each case greater for the Chicago unions than for the New York State unions. This is probably explained in part by the influence on the Chicago unions of the favorable attitude expressed by the American Federation of Labor in its Report on Industrial Education, a copy of which was sent to the Chicago unions.

Attitude of skilled workmen

The attitude of the skilled workman on the question of industrial training is, of course, of special importance, because his interests are more directly affected by such training, than are those of the unskilled workman.

On the basis of skill the replies from Chicago unions may be classified, more or less accurately, into 77 replies from unions in skilled occupations, and 36 from unions in unskilled occupations. Analysis of the total number of "No's" received shows that all but 4 came from unions in the skilled occupations, as set forth in the following table.

[7] The numbers classified in the New York report as "qualified yes" and "qualified no" are here counted as "yes" and "no," respectively, to correspond with the classification used for the Chicago replies.

TABLE 22.— NUMBER OF UNIONS ANSWERING "NO"[8]

	Skilled occupations	Unskilled occupations
Question 1	15	4
Question 2	20	4
Question 3	11	4
Total	46	12

The results in Table 22 are what one would naturally expect — that the opposition which is shown by organized labor to industrial schools should come mainly from the skilled occupations. The replies also show, however, that about 80 per cent of the unions in the skilled occupations answered "Yes" to question 1, about 74 per cent answered "Yes" to question 2, and about 83 per cent to question 3.

The attitude of the carpenters and joiners may be of special importance because of their interest in the Apprentice Schools for carpenters conducted by the public-school authorities. Of the nine carpenters' unions replying, two were not sufficiently interested to answer the questions, one way or the other. Of the remaining seven, all answered "Yes" to question 3; all but one answered "Yes" to question 1, and all but two answered "Yes" to question 2.

Comments of individual unions

The letter addressed to the local unions contained the statement that the Committee on Schools of the Chicago Federation of Labor would welcome any suggestions or comments which the local union cared to make on any of the questions or on the general subject. In response to this statement a number of very intelligent and discriminating comments were received. All of the comments which seemed to have significance are here quoted, regardless of which side of the question is favored.

Thirty-four quotations in all are given. The comments are arranged in groups, each group being more or less homogeneous. Special attention is called to the comments in group VI, which refer to the status of trade-school graduates and to the importance of securing State legislation regulating apprenticeship conditions.

GROUP I

Q. 1, 2, 3. Yes; we are always glad to see the boys and girls get the chance to help themselves.

Q. 1, 2, 3. Yes; if you make all-around mechanics of them, not specialists.

[8] The unions regarded as in skilled occupations, in Table 22, are: bakers and confectioners, blacksmiths and helpers, carpenters and joiners, carriage and wagon workers, cigarmakers, coopers, gardeners and florists, garmentworkers, lithographers, painters and decorators, photoengravers, piano workers, printers, pressmen (printing), sheet-metal workers, tailors, watch-case engravers, two joint councils or assemblies, and one unknown union. The unions regarded as in unskilled occupations are: bartenders, beer bottlers, mailers, lake seamen and switchmen.

Q. 1. Yes; provided it would not be made an excuse for trying "fads" on the children.

Q. 2, 3. Yes; provided cultural studies be not eliminated from the course of study, and that these schools be conducted in the same buildings and in connection with the common school.

Q. 1. No; because it would make for enslavement of children.

Q. 1. No; we favor a high-school education for all children.

Q. 2. Yes; provided such education is included in high-school course.

Group II

Q. 3. Yes; but would it be fair to require the tired youngsters to study after perhaps a big day's work?

Q. 3. If the youngsters work during the day it would do them little good to attend evening schools.

Q. 3. No; they work too many hours as it is.

Group III

Q. 1, 2, 3. Your communication in reference to Industrial Education did not seem to appeal to our local and same was ordered received and filed at one of our large meetings. It seems as though the workers do not care to take up such matters unless some effect of same concerns them, directly injuring them in following their trade.

Q. 1, 2, 3. Regarding enclosed folder, beg to say the carpenters of this local are not interested in this question, as they have a school of their own in which all apprentices must go three months every year. This goes to show anyway that they are in favor of industrial schools to a certain extent.

Q. 1, 2, 3. We are somewhat embarrassed to fully comprehend the real purpose of the proposition. We realize that some kind of system should be adopted whereby the workers of our community would have equal opportunity to give their children such education as will compensate them equivalently for their outlay. The question of a school for boys and girls between the ages of sixteen and eighteen seems somewhat beyond the possibility of the workman to afford. On this question our suggestion would be to have it along the lines of municipal ownership.

Q. 1, 2, 3. I do not think many of us have much knowledge of the subject, and so give you the opinion for what it is worth.

Q. 1, 2, 3. These questions were endorsed by our local, but knowledge of the subject seems limited.

Group IV

Q. 1. Yes. Q. 2, 3. Yes; provided the teachers of the various crafts had worked at least three years as journeymen at the crafts they taught; otherwise, no.

Q. 2. Yes; if under supervision of mechanics affiliated with labor unions.

Q. 1, 2, 3. Not until we voters can have representatives on the school board.

Q. 1. Yes; provided organized labor has voting majority in Board of Education.

Q. 1, 2. No; because the interests would see to it that no education would be given to the pupils along trades-union lines.

Q. 1, 2, 3. *No;* for the reason that such an institution would be simply placing organized labor in greater jeopardy than at present; for you must realize that it would not be possible to instil any of the principles of unionism into such students — in fact, even the mention of such ideas would meet with the strongest of opposition; therefore we would urge action against the establishment of such a *public* institution.

Would suggest the establishment of schools on such lines by the international bodies of the different trades — the same to be so conducted as to permit of evening sessions, and no doubt but what they would be attended by a class of students who really would have a desire to learn a trade and become proficient in it.

Group V

Q. 1, 2, 3. Yes; provided these schools are conducted for the benefit of boys and girls only, and not to be used as a profit system for somebody else.

Q. 2. Yes; provided it is not made a breeding bed for scabs.

Q. 1, 2, 3. We believe that the industrial school will develop into a recruiting station for the unfair employer.

Q. 1, 2. Do not favor this kind of school because it would cause an over-production of skilled mechanics.

Q. 1, 2, 3. No. We do not think it advisable to use public money to play into the hand of the manufacturers. Those whose children would be able to attend a free trade school, as a rule, are also able to pay for that instruction.

Q. 2. No. We believe it unwise to permit school boards to establish trade schools, because if a certain kind of men, interested in a certain kind of employment, obtained control of the schools, our schools would simply be used to turn out a surplus of labor for the trades in which certain employers sought to cheapen labor.

Group VI

Q. 2. Yes; but would make the term apprenticeship three years, to conform to the present laws of organizations making the apprenticeship end at age of twenty-one years.

Q. 2. No; all graduates should serve their full time under regulated union laws.

Q. 3. Yes; to those holding membership in a recognized union.

Q. 2. No; blacksmiths rule that an apprentice must serve four consecutive years at practical work.

Q. 2. No; because we have found it detrimental to our apprentice system, which requires four years of practical training.

Q. 2. Yes; provided that no employer shall employ them as full-fledged craftsmen, such to be prohibited by an act of legislature.

Q. 1, 2. We do not believe that the present laws are such as to make public trade schools giving instructions, as set forth in questions 1 and 2, advisable from an organization point of view. It is worthy of note that every

branch of industry so supplied by schools is over-run with student workmen, little or no organization, small wages, etc.

On the other hand, if an approved apprentice term can be enforced, making such term a necessity by law, before entering the trades, we believe that much good would result from such teaching as set forth in question 1, enforcing said term to protect labor organizations in case of strike or lockout, when there would be a great temptation for the bosses to work these near-mechanics.

We urge careful consideration before disposing of this matter, as it is a subject of vast importance to union labor movement.

Attitude of labor leaders in Chicago

In addition to the above report of the Chicago Federation of Labor, the following specific statements of labor's attitude, taken from articles by three of Chicago's citizens prominent in the ranks of labor, will be of interest.

1. By Luke Grant, Labor Editor, Chicago *Record-Herald*.[9]

The specialization of industry is rapidly dehumanizing the worker. When he makes a certain part of a machine he does not in his mind see a picture of the finished product, as did the all-around mechanic in the days before we had specialization in industry.

You who have not had the actual experience cannot appreciate the real pleasure it gives a workman to look at a piece of work he has done well. He takes as much pleasure in looking at a piece of perfect mechanical work as the painter does in admiring a fine picture, or the writer does in reading a good book. This is a phase of the problem which should have attention, as well as the phase dealing with increased productivity. If it does not, we will in the near future have a class of workers mentally and morally deficient, and a class of work that will not stand in competition in the markets of the world.

This forms what I mean by the "human side" of the problem. If industrial education and trade schools will serve to give the boy that thorough and complete knowledge of the trade, which he is denied in the modern factory and workshop, I am satisfied you will find no opposition on the part of the wage-earner. You will receive his hearty coöperation and support, for the skilled mechanic cannot help feeling a pang as he sees his trade disappearing.

Let us unite to do all in our power to lessen the cost of production, but let us not forget that if we cheapen product at the expense of the health and mental view of our workers, the ends will not justify the means.

[9] Taken from Bulletin No. 6, National Society for the Promotion of Industrial Education.

2. By W. B. Prescott, Secretary, International Typographical Union Commission on Supplemental Trade Education, Chicago.[10]

For employing printers to say they would thoroughly "teach" a boy the trade was largely a figure of speech; with few exceptions they could not if they would, as they lacked the facilities. The boy would be turned over to a foreman or superintendent, who is always harassed with demands that he reduce the cost of production, and who in turn is ever urging those under him to greater effort or devising plans to meet the insistent demand for an increased output.

In these circumstances it is not surprising that the foreman's chief desire is not to teach the boy the trade, but to discover how he can be used most profitably. If the boy shows special aptness for some simple operation, his "apprenticeship" too often consists in doing that one thing. If he acquires a general knowledge of the trade, it is as best he may by the rule of thumb.

This system has been producing so-called specialists, and some are inclined to say it is all right in an age of specialists, as they point to this lawyer or that physician or financier who has had unbounded success by following a specialty in his profession. They forget that the physician is first well grounded in the principles and practice of medicine, and the attorney in the principles of law, before selecting their specialties. That general knowledge is of great assistance to them. The workman trained in the manner just described may be a specialist at his trade, but it is because that one operation is the extent of his knowledge of his vocation. In the highly specialized trades the dread dead line, or age limit, is placed at an early year, and precarious employment is the rule. Not being transferable from one class of work to another, this kind of "specialist" is the victim of the greatest blight that can come athwart a wage-earner's life — unsteady employment. While the old apprenticeship system was decaying the quality of the printed page was improving. The improvement is due in great measure to the influence of commercial artists who design work to the last detail, which the artisan copies with more or less fidelity. This precludes even the most capable compositors exercising their ingenuity or skill, thereby reducing them to the grade of mere copyists, which is fatal to the development of originality or mental growth.

The International Typographical Union has been included in the general denunciation of trade unions for being opposed to technical education. Frankly, it is opposed to many of the schemes being fostered under the cloak of trade education. It is opposed to educational efforts that are more intent on making money for their promoters than on benefiting the scholars. It is also opposed to schools that graduate inferior workmen. The typographical union holds it to be folly to erect special machinery to entice men or boys to take up trades that are already overcrowded. In short, the union contends — and it knows — that there is no dearth of mechanics and artisans, but the great army of them are not as skillful as is desirable. This is not their fault, nor that of their employers, but of industrialism. In helping

[10] Taken from The Annals of the American Academy of Political and Social Science, January, 1909.

these to better things, the union believes it is subserving the interests of the individual, the craft and society, and that is why the union printers of the United States and Canada are spending approximately $15,000 a year to advance the interests of supplemental trade education.

3. By John Fitzpatrick, President of the Chicago Federation of Labor.[11]

I am in favor generally of industrial education. I believe that all trades can be taught, and consider that the aim of the trade school should be to give the best preparatory and practical education possible.

The question as to how far the trade schools can give preparation for the trade can only be determined by experience.

I would have all trade schools open to all — sex, creed, color or nationality should not debar any one. I favor preparatory trade-school work under public auspices, but do not favor trade schools conducted by manufacturing concerns. I deprecate certain schools now organized; referring in this to correspondence and other trade schools, which cannot give practical education, and because of this deceive both the student and the employer.

The American Federation of Labor

The following quotation from the Report on Industrial Education, by the American Federation of Labor, also throws light on labor's attitude.

We believe that as much attention should be given to the proper education of those who are at work in our industries as is now given to those who prepare to enter professional and managerial careers, simply to balance justice and make it necessary to give to the wage-earning classes and the common industries such equivalent as we can for what the present schools are doing for the wealthier classes, as well as for the professional and managing vocations.

Our movement in advocating industrial education protests most emphatically against the elimination from our public school system of any line of learning now taught. Education, technically or industrially, must be supplementary to and in connection with our modern school system. That for which our movement stands will tend to make better workers of our future citizens, better citizens of our future workers.

[11] Taken from Bulletin No. 3, National Society for the Promotion of Industrial Education.

CHAPTER V

INDUSTRIAL SCHOOLS AND COURSES IN CHICAGO

This chapter presents — I, a description, with comments, of public industrial schools and courses in Chicago; II, an outline statement of present provisions for public industrial education in day schools in Chicago and in five other cities, viewing each city as a whole; and III, a description of some private industrial schools in Chicago. All the schools described were visited by the writer.

I. Public Industrial Schools and Courses

High Schools

1. In the Chicago high schools four years of manual or technical training are offered in each of three schools. In eleven other high schools one year of manual training is offered at present. The school administration is working toward the plan of having the first two years of manual training and vocational courses in all high schools except the three technical high schools, which " will receive those pupils only who wish to continue their vocational work after two years and will give them advanced technical training beyond that now offered in the technical high schools of Chicago."[1]

Before the school year of 1910-11 the work of the three technical high schools was in what may be regarded as a stage of transition from purely manual training work to truly technical work.[2] For, in the first place, a considerably larger portion of the school time[3] has been given to shopwork and drawing than is given to these subjects in the usual manual-training school,[4] and yet this amount of time is not sufficient to adequately meet the needs of technical education in the high school.

[1] Report of the Superintendent of Schools, 1910.

[2] The distinction here made between the manual-training high school and the truly technical high school is about the same as that presented in the report on *The Place of Industries in Public Education,* by a committee of the National Council of Education, July, 1910.

[3] From two-fifths to one-half, in the scientific course. In this statement, and similarly throughout the report, the time devoted to physical training, study, opening exercises, and music, is not counted in computing the relative amounts of time given to shopwork and drawing, on the one hand, and to academic subjects, on the other.

[4] For a statement of the amount of time given to manual work in 159 high schools, see page 87 of the report mentioned in note 2, above.

In the second place, the shopwork differs from that done in the usual manual training high school, in that the projects made partake less of the character of mere " exercises " and more of the character of articles of real use.

In addition to the usual manual training " exercises," pieces of furniture, and articles for ornament, the following objects for more practical use were made in one technical high school in 1909-10: 6 speed lathes, 1 two-cylinder engine, 20 metal counting slates for blind children, 3 metal clock faces for neighboring school, electric motors (complete), 35 molder's benches (iron), turning chisels, machine tools, and various parts of machines. For the year 1910-11, machinery and furniture to the value of $3,000 to $5,00 was being made for the Board of Education.

In another technical high school the following products were under construction in 1909-10: 6 speed lathes, 12 jack screws, 6 high-speed drill-presses, 13 marine engines, electric motor, 2 rheostats, iron pulleys, machine tools, and various parts of machines.

In the third technical high school comparatively little work of the above character is done.

It should be added, that a semester course has been given in the fourth year, in elementary engineering or electrical construction, which is technical in character.

In the third place, comparatively little has been done in relating the academic instruction to the shopwork and to industrial needs.

Only one of the three technical high schools, so far as could be learned, has done definitely planned work of this kind in day classes. The principal of this school states that about one-fourth of the compositions in English classes are based on shop and industrial subjects. These compositions are criticized by the shop instructor and by the English instructor. Outside reading is assigned on the lives of great inventors, discoverers, and explorers. In physiography about six weeks is given to a study of trees and ores. The study of trees includes elementary forestry, the structure of the various woods used in the school, and the location of the forest regions of the world. The work on ores includes an examination of the samples of iron ores, the locations of ore beds, smelters, rolling mills, coal fields, shipping routes, and the making of steel and coke.

In the night classes of this school some interesting work is given in shop mathematics, including mensuration, speed of pulleys and gearing, gearing of the lathe and screw thread calculations, calculations of spur, bevel, spiral and worm gearing; speed of machine tools, elementary principles of graphic statics, elements of theory of stresses as applied to machine design, use of tables of natural functions and of logarithms in shop calculations; the slide rule.

2. With the inauguration of the two-year vocational courses in September, 1910, the Chicago high schools begin to offer instruction

distinctly industrial in character. These two-year courses are a part of a completely revised curriculum for the high schools which went into effect the second semester of 1910-11. There are 21 courses of study in the revised curriculum, 11 being four-year courses and 10 two-year courses.[5]

Of the four-year courses, five may be regarded as vocational: one commercial — the business course; and four industrial courses — manual training, builders, household arts, architectural. The particular subjects offered in the manual training and builders' courses are as follows:

7.— Manual Training Course

FIRST YEAR

First Semester:	Weeks	Periods	Credits
English	20	4	.4
Woodworking	20	10	.5
Mechanical drawing	20	4	.3
Freehand drawing	20	1	.05
Algebra	20	4	.4
Physiology	20	5	.4
Physical education	20	2	.1
		30	2.15
Second Semester:			
English	20	4	.4
Woodworking	20	10	.5
Mechanical drawing	20	4	.3
Freehand drawing	20	1	.05
Algebra	20	4	.4
Physiography (with special reference to woods and ores)	20	5	.4
Physical education	20	2	.1
		30	2.15

SECOND YEAR

First Semester:	Weeks	Periods	Credits
English	20	4	.4
Foundry, forge and patternmaking	20	10	.5
Mechanical drawing	20	4	.3
Plane geometry	20	4	.4
Physical education	20	2	.1
		24	1.7

[5] For the sake of completeness, the commercial courses are included in the discussion which follows.

Second Semester:	Weeks	Periods	Credits
English	20	4	.4
Foundry, forge and patternmaking	20	10	.5
Mechanical drawing	20	4	.3
Plane geometry	20	4	.4
Physical education	20	2	.1
		24	1.7
Choose one of the following:			
Foreign language	40	5	1.0
Biology	40	5	1.0
Elementary physics	40	6	1.0
*Chemistry	40	6	1.0

THIRD YEAR

First Semester:			
Machine-shop practice	20	8	.4
English	20	4	.4
Freehand drawing	20	1	.05
Mathematics	20	4	.4
Physics	20	6	.5
Physical education	20	2	.1
		25	1.85
Second Semester:			
Machine-shop practice	20	8	.4
Machine or architectural drawing	20	4	.3
Freehand drawing	20	1	.05
Physics	20	6	.5
Mathematics	20	4	.4
Physical education	20	2	.1
		25	1.75
Choose one of the following:			
History	40	4	.4
Language	40	5	1.0

FOURTH YEAR

First Semester:			
United States history	20	4	.4
Machine or architectural drawing	20	3	.2
English	20	4	.4
Physical education	20	2	.1
		13	1.1

* If chemistry is not taken now it must be taken in the fourth year.

Second Semester:	Weeks	Periods	Credits
Civics	20	4	.4
Machine or architectural drawing	20	3	.2
Trigonometry	20	4	.4
Physical education	20	2	.1
		13	1.1

Electives:			
Chemistry	40	6	1.0
Language	40	5	1.0
English	20	4	.4
Electrical or gas engine construction	40	6	1.0
Electrical or gas engine construction	20	4	.4
Freehand drawing	40	6	.8
Advanced physics	20	6	.5
Advanced chemistry	20	6	.5

One semester of English must be chosen during this year by those who have not taken a foreign language.

8.— Builders' Course

FIRST YEAR

First Semester:	Weeks	Periods
Business English	20	4
Mensuration geometry	20	4
Physiology	20	5
Architectural drawing	20	4
Carpentry	20	10
Physical education	20	2
		29

Second Semester:		
Business English	20	4
Mensuration geometry	20	4
Freehand drawing	20	4
Mechanical drawing	20	4
Carpentry	20	10
Physical education	20	2
		28

SECOND YEAR

First Semester:	Weeks	Periods
Business English	20	4
Arithmetic and bookkeeping	20	4
Chemistry	20	6
Architectural drawing	20	4
Bricklaying, masonry, etc	20	10
Physical education	20	2
		30
Second Semester:		
Business English	20	4
Arithmetic and bookkeeping	20	4
Chemistry	20	6
Architectural drawing	20	4
Bricklaying, masonry, etc	20	10
Physical education	20	2
		30

THIRD YEAR

First Semester:		
English	20	4
Mathematics, including trigonometry and surveying	20	4
Physics	20	6
Architectural drawing	20	4
Metal work	20	10
Physical education	20	2
		30
Second Semester:		
English	20	4
Mathematics, including trigonometry and surveying	20	4
Physics	20	6
Architectural drawing	20	4
Metal work	20	10
Physical education	20	2
		30

FOURTH YEAR

First Semester:		
Sanitation	20	4
Building specifications and estimating	20	4
Industrial history	20	4
Electrical wiring	20	10
Freehand drawing	20	4
Physical education	20	2
		28

Second Semester:	Weeks	Periods
Strength of materials	20	4
Building contracts and ordinances	20	4
Industrial history	20	4
Electrical wiring	20	10
Freehand drawing	20	4
Physical education	20	2
		28

Comment. The distinctive features of the four industrial courses are:

(1) A slight increase in the amount of time given to shopwork and drawing.[6]

(2) The "industrialized" character of some of the academic subjects, such as industrial history, business English, civic and industrial Chicago.

With repect to both of these features there is evident an effort to make the four courses truly vocational in character. If, however, they are to reach their full development, the close relation of the academic subjects to industrial needs should be carried to still other subjects than those indicated in the present outlines. If the physics, chemistry and mathematics are to be of the greatest service in the industrial courses, the content of these subjects should be closely adapted to the particular needs in the different courses.

Under present conditions it is difficult to organize the subjects of history, mathematics and science in their direct application to industrial needs. This is partly due to a lack of suitable text and reference books, and to the prevailing influence of college entrance requirements on secondary school curricula. But the need and the opportunity for such instruction in technical high-school courses are both very great. Some schools are now making commendable efforts in this direction.[7]

In the household arts course, something less than half the time is given to handwork, including art, an increase of only two periods a week over former courses. This is less time than is given to these subjects in the industrial courses for girls in the high schools at

[6] An average of about 51 per cent of the school time in the revised manual-training course, as compared with 45 per cent in the former scientific course.

[7] Reference is here made to subjects of study outlined in Chapter VIII of this report, and to outlines of mathematics, physiography and English, prepared at the Lane Technical High School, Chicago.

Boston, Cleveland and Cincinnati [see pages 193-195]. These cities also provide for specialization in the last two or three years of the course, in order to prepare definitely for the vocations open to girls. No specialization is offered in the corresponding course in Chicago.

In the manual training course the time given to shop and drawing is still somewhat less than in the Cincinnati and Cleveland courses,[8] and the opportunity for specialization is not so great.[9] In Cincinnati the usual four years of manual training is completed in the first two years, five-eighths of the school time being given to shop and drawing. In the last two years students specialize in some trade as apprentices, spending alternate weeks in factory and school, the shopwork for the week in school being specialized. The same general plan is followed in Cleveland, the usual four years of manual training being completed in the first two and one-third years. Both Cincinnati and Cleveland require a longer school week for the technical courses than Chicago requires. In the Chicago manual training course 21 to 25 hours (60 minutes each) a week are required, as compared with 30 in Cleveland and 25½ in Cincinnati.

The builders' course is the only four-year course of that character in public high schools of the country, so far as the writer knows. By giving introductory shopwork in a number of the building trades, with related academic subjects and drawing, the course prepares primarily for positions as foreman, superintendent or general contractor. From 50 to 57 per cent of the time is devoted to shopwork and drawing. As outlined, it is an excellent example of a course in which the academic subjects are closely related to the constructive industries. In chemistry and physics, the outlines do not indicate whether the subject-matter is to be presented in terms of its application to the building industries, but the opportunity for such application is especially good in these subjects.

The architectural course prepares for work in architecture and in drafting-rooms, and gives from two-fifths to one-half of the school time to shopwork, drawing and architectural design. Shopwork is offered in the first year only.

In the business course the subjects offered are as follows:

[8] See pp. 193,195.

[9] The only specialization now offered is in electrical or gas-engine construction in the fourth year. This subject may be taken as a year-subject, 6 periods a week, or as a semester-subject, as formerly offered, 4 periods a week.

6.— Business Course

FIRST YEAR

First Semester:	Weeks	Periods	Credits
Business English	20	4	.4
Business arithmetic	20	4	.4
Physiology	20	5	.4
Drawing	20	4	.3
Business forms and penmanship	20	2	.15
Physical education	20	2	.1
		21	1.75

Second Semester:			
Business English	20	4	.4
Business arithmetic	20	4	.4
Civic and industrial Chicago	20	5	.4
Drawing	20	4	.3
Business forms and penmanship	20	2	.15
Physical education	20	2	.1
		21	1.75

SECOND YEAR

First Semester:			
Business English	20	4	.4
Commercial geography	20	5	.4
Business methods and office practice	20	4	.3
Drawing	20	4	.3
Physical education	20	2	.1
		19	1.5

Second Semester:			
Business English	20	4	.4
Commercial geography	20	5	.4
Drawing	20	4	.3
Physical education	20	2	.1
		15	1.2

Bookkeeping (one-half year) is required for those not intending to take bookkeeping in the third or fourth year in the vocational courses.

THIRD YEAR

First Semester:			
English	20	4	.4
Industrial history	20	4	.4
Physical education	20	2	.1
		10	.9

Second Semester:	Weeks	Periods	Credits
English	20	4	.4
Industrial history	20	4	.4
Physical education	20	2	.1
		10	.9

Choose from the list of optional studies enough to complete four credits for the year's work: at least .8 credits each semester must be for commercial studies.

FOURTH YEAR

First Semester:	Weeks	Periods	Credits
English	20	4	.4
Economics and commercial law	20	4	.4
United States history and civics	20	4	.4
Physical education	20	2	.1
		14.	1.3
Second Semester:			
English	20	4	.4
Economics and commercial law	20	4	.4
United States history and civics	20	4	.4
Physical education	20	2	.1
		14	1.3

Choose from the list of optional studies enough to complete four credits for the year's work: at least .8 credits each semester must be for commercial studies.

The time given to mathematics in the business course is less than half as much as is given to this subject in the first two years in the Cleveland High School of Commerce.[10] In the Cleveland school attention is given to mental arithmetic, rapid calculation and penmanship incidentally throughout the entire course.

In the third and fourth years of the business course at least .8 credits each semester must be for commercial subjects listed with the general group of optional studies for all courses. A clearer idea of the content of the business course would be obtained by parents and pupils if the technical subjects, as accounting, stenography, etc., which should form the backbone of the course, were given a more definite place in the outline of the course.

[10] Course of Study, 1909.

3. The two-year vocational courses are open to graduates of the eighth grade only, and are intended mainly for students who can not give four years to a general high-school education, but who can give two years to training along definite vocational lines. It is expected by the school authorities that these courses will attract to the high school a considerable number of students who would not otherwise enter. Full credit is allowed toward graduation from a regular four-year course, in case students decide to continue beyond the two years.

The following ten courses are offered: 12, accounting; 13, stenography; 14, mechanical drawing; 15, design; 16, advanced carpentry; 17, patternmaking; 18, machine-shop work; 19, electricity; 20, household arts; and 21, printing. The first two may be regarded as commercial and the remaining courses as industrial in character.

The particular subjects offered in patternmaking and in electricity are as follows:

17.— Two-year Course in Patternmaking

FIRST YEAR

	Weeks	Periods
Business English	40	4
Shop mathematics	40	4
Shop:		
(a) General woodwork (one semester)		
(b) Elementary patternmaking (one semester)	40	10
Mechanical drawing	40	4
Physiology (first semester)	20	5
Freehand drawing (second semester)	20	4
Physical education	40	2
		29 or 28

SECOND YEAR

	Weeks	Periods
English or other modern language	40	4
Geometry, or history with special reference to industrial and economic conditions, and civics	40	4
Shop — Foundry and advanced patternmaking	40	12
Mechanical drawing	40	4
Freehand drawing	40	2
Physical education	40	2
		28

19.—Two-year Course in Electricity

FIRST YEAR

	Weeks	Periods
Business English	40	4
Algebra	40	4
Science:		
Physiology (first semester)	20	5
Elementary physics (first semester)	20	5
Elementary electricity (second semester)	20	8
Mechanical drawing	40	4
Freehand drawing	40	2
Physical education	40	2
		26 or 24

SECOND YEAR

	Weeks	Periods
English or other modern language	40	4
Geometry, or history with special reference to industrial and economic conditions, and civics	40	4
Applied electricity	40	10
Mechanical drawing	40	4
Freehand drawing	40	2
Physical education	40	2
		26

The distinctive features of the two-year industrial courses are:

(1) The large portion of time (from one-half to two-thirds)[11] allotted to shop work and drawing;

(2) The specialization in a particular trade required from the beginning;

(3) The "industrialized" character of some of the academic courses, such as shop mathematics, business English, and industrial history.

Comment. With respect to the first and third features mentioned above, the courses compare favorably with industrial courses in other cities. It should be noted that industrial geography is not offered in any of the courses, and that technical instruction in applied science is provided for in only one course[12] — in electricity.

[11] Except the courses in design and in household arts which give to handwork, including art, something less than half of the school time.

[12] Unless the biology offered in the household arts courses is to be organized as applied biology. The half year of science in certain other courses is understood to be physiography, according to the statements of principals and teachers.

With respect to the second feature it should be noted that the subjects in each course are closely related to a particular trade. The courses differ, therefore, from the usual technical high-school courses which give an all-around shop training before specialization is permitted. They differ also from the trade course proper, which in common practice gives very little instruction in related academic subjects. They may, therefore, be regarded as technical courses restricted to a particular trade.

No other public high school, so far as the writer knows, offers technical courses so restricted.[13] The present practice is to give an all-around technical training for at least two or three years before specialization is permitted. Certain private schools[14] offer technical courses restricted to a particular trade, but the students are commonly sixteen years of age or older when entering upon these courses, and the schools operate under conditions which enable them to secure a rather select body of students.

In the Chicago two-year courses the student is asked to specialize — to choose his trade — when he enters the high school, and this specialization is required on the basis of no previous shop training other than the elementary woodwork of the grades, which is not vocational in purpose. There is in general no objection to a boy specializing in a trade whenever he is mature enough to do the work and to really know what he wants to do. Whether or not there are many such students in the first year of high school remains to be seen.[15] Surely, for those who have not reached that stage of maturity by the first year of high school, the two years of all-around practical training, as provided in Cincinnati,[16] would be more desirable even if the last two years of specialized work are not taken in school.

As stated before, the two-year courses are planned for students

[13] See section 5, p. 193 ff. The two-year courses in St. Louis can hardly be called technical courses, since they merely permit the individual pupil, on the approval of the principal, to lengthen his school day by doing additional work of the usual manual-training and domestic art type.

[14] The Williamson School of Trades, the Carnegie School for Apprentices and Journeymen, and the Wilmerding School of Mechanical Arts.

[15] Forty-seven and four-tenths per cent of the boys in the first year of all Chicago high schools were fourteen years of age or under, 30.8 per cent were fifteen, and 21.6 per cent were sixteen or over, according to the Superintendent's Report, 1909. The percentage in the older group would probably be about 16.4, if taken in the preceding September when the selection of courses is made. Hence, about 85 per cent of the boys entering high school in September were under sixteen years of age, which is the minimum age at which specialization is commonly begun.

[16] See p. 195.

who can not give more than two years to a high-school course. The number of these is very likely not so great as is sometimes supposed. The tacit assumption frequently made that most pupils who leave school in the intermediate grades do so because they can not afford to continue is not supported by evidence. Indeed, the evidence that exists [see pages 36-39] lends color to the assumption that they leave because the school does not provide the kind of training needed. It is probable that many of those who now drop out in the first year or two of the high school would remain for a four-year course if they understood that the training of those four years was not mainly a preparation for more training in college, but was a true finishing course preparing definitely for a life career after high school.

It is, therefore, pertinent to inquire whether what is wanted on the high-school level is a short course so much as it is a course that is very practical. The present four-year course in manual training provides for those who go on to college and for those who are interested in manual training for general educational purposes, regardless of specific training for industrial pursuits. For those students, however, who desire to enter the industries at once after four years in the high school, the present manual training course does not make adequate provision. Courses like those in Cincinnati and Cleveland,[17] with specialization in the last two years, are desirable. It is just this specialization in the last two years, on the basis of an all-around training in the first two years, which makes these courses the finishing courses needed by those who are to enter the industries at once upon completion of the high school.

The question is whether a course like that at Cincinnati or Cleveland would not hold for the full four years many of those who are now supposed to be unable to remain longer than two years. For those who are really unable to remain the four years, provision could be made by relating the instruction in each year of the four-year course so closely to industrial needs that each year's work is a unit of definite practical value to those who leave at the end of that year. Furthermore, the opportunity to specialize at various points in the course could also be given to students whose maturity, financial condition, and prerequisite training make such specialization desirable.

The main point here in mind is that the two-year industrial

[17] See pp. 193, 195. The experience of Cleveland indicates that such courses might also in time be generally endorsed by colleges as providing satisfactory preparation for college technical courses.

courses provide for the relatively small number who, upon graduation from the eighth grade, have the necessary maturity and the prerequisite training to profit by the specialized courses offered, and who are really unable for financial reasons to remain longer than two years. In providing a more practical kind of instruction than heretofore offered, the two-year courses are undoubtedly a step in advance and as such are to be commended. That they may fill a present need must be admitted. It is here contended, however, that this need is comparatively small and that the greatest need in the high school is for a four-year course of the kind referred to, still more practical as a finishing course than the present four-year course. An appropriate degree of flexibility in such a four-year course would, no doubt, adequately meet the needs of all students for whom the present two-year courses are planned.

It is the plan to offer some or all of the ten vocational courses in Chicago in each of the nineteen high schools. The number and per cent of pupils enrolled in the first nine[18] courses in the third week of September, 1910, were as follows:

	Course	Number	Per Cent	Group
12.	Accounting	907	33.3	77.2
13.	Stenography	1,197	43.9	
14.	Mechanical drawing	188	6.9	
15.	Design	14	0.5	
16.	Advanced carpentry	61	2.2	3.4
17.	Patternmaking	14	0.5	
18.	Machine-shop work	21	0.7	
19.	Electricity	261	9.5	
20.	Household arts	58	2.1	
	Total	2,721		

[18] Course 21, printing, was not offered until the second semester, 1910-11.

The number and per cent of pupils enrolled in the ten courses in December, 1911, as furnished by the Superintendent of Schools, were as follows:

No. of course	12	13	14	15	16	17	18	19	20	21	Total
No. enrolled	1,009	1,773	210	6	46	7	56	337	57	0	3,501
Per cent of total enrolment	28.8	50.6	5.9	0.17	1.3	0.19	1.5	9.6	1.6	0.0	99.66
	79.4				2.99						

The table reinforces in every particular the statements made on page 98 concerning the enrolment in September, 1910.

It is hardly possible to draw reliable conclusions from the number of pupils registered in the two-year courses, since they are as yet too new to have been adequately brought to the attention of parents and pupils. The numbers in the above table, however, do not contradict the statement that practical training along commercial lines is attractive to beginning high-school pupils. Electricity and mechanical drawing are next in order of popularity. These two courses, together with the commercial courses, enroll about 94 per cent of the pupils.

The small numbers in courses 16, 17 and 18 are worthy of note. With reference to these courses, it may be suggested that in order to eventually attract large numbers of high-school pupils it must be well understood by parents and pupils that the courses prepare for ultimate positions above that of the ordinary mechanic. For high-school students have the academic preparation, and it is safe to assume that they have, for the most part, the ambition and the family "push" to take advantage of distinctly technical instruction leading ultimately to advanced positions. For this reason the technical phases of the academic subjects should receive greater emphasis than the present outlines show, by introducing applied science and more of the applied mathematics, especially in the second year. The more narrow trade training, preparing mainly for the work of the actual mechanic, is more appropriate on the lower academic levels, for the large number of children, fourteen years of age, who leave school in grades below the eighth, to go to work, although the industries offer little or no opportunity for appropriate training at this age. Even here specialization would be appropriately preceded by a period of all-around shopwork, and as much as possible of technical instruction in applied science, mathematics, etc., should, of course, be given. The high school is, however, preëminently the place to train the leaders, at least the non-commissioned officers in the industrial army, whereas the rank and file are and probably will be obtained mainly from the lower academic levels.

The character of the instruction now given in the two-year industrial courses varies considerably in the nine high schools visited by the committee's representative. In the shop work in carpentry, for example, two of the schools visited are giving actual carpenter work while the remaining schools are giving the conventional manual training work in wood. In the course in electricity some schools are introducing the actual construction work done in the trade, while

other schools are confining themselves to theory. In the drawing and mathematics required in several of the courses, some schools are making commendable efforts to present subject-matter in direct relation to shop and trade work; other schools are doing very little in this direction. One school, operating under specially favorable conditions, has prepared excellent detailed outlines of a tentative nature for some of the shop and academic subjects.

That the character of the instruction should vary in the different high schools is not surprising in view of the newness of the courses and the different conditions prevailing in the different high schools. Not all the instructors are specially prepared to give the kind of instruction needed. A very few were found who seemed to be not in full sympathy with the vocational courses. One principal seemed to think that the vocational courses were merely " on paper." Apparently, some organization and unity of effort are needed whereby the good work done in some schools may be made available to other schools.

In the two-year commercial courses considerable improvement has been made in providing more time than formerly for practice in stenography and accounting. All but two of the schools visited now have enough typewriting machines for the practice work in typewriting. The main criticism to be made on the commercial work is that many of the teachers are not properly prepared for the work. Too frequently teachers with no special knowledge of commercial subjects are taken from the Latin department, for example, to teach business arithmetic, or from the science department to teach bookkeeping. Some teachers of stenography are unable to take dictation themselves. According to the statements of a number of principals and teachers, very few of the teachers of commercial subjects have had experience in business offices. No organized effort is made to study present business practices and office needs or to secure the coöperation and advice of business men with a view to organizing a commercial course suited to present needs. Such study and coöperation is strongly urged by Chicago business men,[19] and is carried on in the commercial high schools of Cleveland and Boston.[19] If the Chicago courses are to be truly commercial, if they are really to be what they pretend to be, this close contact with business needs must, undoubtedly, be secured.

[19] See Chapters IX and XI.

4. In August, 1911, the Chicago Board of Education voted to establish a two-year technical college course in the three technical schools of the city. The courses are planned to provide a broad ground preparing for the work of the third and fourth years of the best engineering schools. Following is the tentative course of study now in operation at the Crane and Lane high schools.

College Engineering Course

FRESHMAN YEAR

First Semester

Required:	Periods
College algebra	5
Chemistry (qualitative analysis)	10
English	2
Descriptive geometry	5
Gymnasium	1
Elective:	
French or German	5
Shopwork	10 or 5
Chemistry (additional)	5
Machine or architectural design	5

Second Semester

Required:	Periods
Analytical geometry	5
Chemistry (quantitative analysis)	10
English	2
Machine or architectural design	5
Gymnasium	1
Elective:	
French or German	5
Shopwork	10 or 5
Chemistry (additional)	5
Machine or architectural design (additional)	5

Work will be arranged so that pupil concentrates on the kind of work desired. French or German is elective if the student presents 2 units for entrance, otherwise it is required.

SOPHOMORE YEAR

First Semester

Required:	Periods
Calculus	5
Physics	8
English	2
Gymnasium	1
Elective:	
Shopwork	5 or 10
Statics	5
Kinematics	5
Steam engineering	10
Electrical engineering	10
Gas engineering	10
Chemical engineering	10
Civil engineering	10
French or German	5

Second Semester

Required:	Periods
Calculus	5
Physics	8
English	2
Gymnasium	1
Elective:	
Shopwork	5 or 10
Statics	5
Kinematics	5
Steam engineering	10
Electrical engineering	10
Gas engineering	10
Chemical engineering	10
Civil engineering	10
French or German	5

Comment. This course is in line with the present movement to take into the high school the work of the first two years of college courses, thus making the curricula of secondary schools in this country similar to those of France and Germany. The course in Chicago provides for some specialization, particularly in the second year, for those who do not wish to go on to engineering schools.

This suggests the desirability of establishing also more highly specialized technical courses in the fifth and sixth years for students who do not continue their work in engineering schools. Such specialized courses could give a high grade of preparation for students — girls as well as boys — to enter the higher ranks of industry below the rank of engineer, or to become teachers of shopwork or drawing in the technical high schools.

5. The Flower Technical High School, for girls, was opened for the first time in September, 1911, offering a four-year course and a two-year course, embracing work tentatively characterized as follows:

(A) A Four-year Course, embracing

1. General household science (including cooking, laundry work, house sanitation and management, and household accounts); intensified training to be given to those who wish to become institutional workers, managers of kitchens and lunchrooms, invalid and diet workers, and emergency workers.

2. Household arts (including plain sewing, dressmaking, millinery, embroidery, lacemaking, infants' and children's clothing, care of hospital and hotel linen, and interior decorating); intensified training to be given to those who wish to fit themselves for supervising and for special work; machines run by electricity and foot power to be used.

3. Science (including chemistry and biology, taught with a view to understanding the experiences and needs of daily life, as well as with the idea of gaining an insight into scientific method and theory).

4. Art, with specialized work in costume, millinery and embroidery designing.

5. English, both utilitarian and cultural.

6. Applied mathematics.

7. Geography, history and civics, with special reference to the needs of women in Chicago.

8. Physical education and physiology, with the idea of improving health and of giving recreation and training in social requirements.

9. Music as a recreative and cultural study.

(B) A Two-year Course, coinciding in part with the four-year course, but shaped to fit students for industrial employment by the end of the second year.

Courses in salesmanship, typesetting, boxmaking, and other industries to be organized as needed.

The school will contain a fully equipped lunchroom.

The school-week is 25 hours, about two-fifths[20] of the time being given to handwork, including drawing. The present tentative plans provide for specialization in a particular trade during the last two years, more or less, of the four-year course, and for the last half of the two-year course. In these specialized courses somewhat more than two-fifths of the school time will probably be given to shop-work and drawing. It is also planned to add a fifth and a sixth year to the four-year course as the need arises.

For the present, the building is used also by an elementary industrial class, which is intended primarily for over-age girls from grades 4 to 8, inclusive, who are at least fourteen years of age and at least two years behind grade. About one-half of the 25-hour week is given to handwork, including drawing, in this class, the remaining time being devoted to such elementary academic studies as are suited to the needs of the pupils.

About 65 pupils were enrolled in the high-school classes in November, 1911, and about 35 in the elementary industrial class. In the high school, one class is now in operation in the first year, and one in the second year, of the four-year course, and one class in the first year of the two-year course. In addition, a few students with an academic status above that of the second year of the high school are accommodated.

Comment. In providing for specialized work in particular trades the Flower Technical High School aims to be a true finishing school, giving direct preparation for girls to enter the industries at once after graduation, and in this respect compares favorably with similar schools in Boston, Cleveland and Cincinnati.[21] The latter schools, however, give more time[22] to handwork, including drawing, than is at present given to these subjects in the Flower Technical High School. The Flower School gives no more time to these subjects in the first two years than is provided in the regular high-school course of study for the household-arts course. The time allotted to these subjects should be increased to one-half or five-eighths of the school time in the first year or two, and in the latter part of the course should occupy two-thirds or more of the school time.

The school has not at the present writing provided a definite and

[20] The time allotted to music, physical education and study is not counted in computing this ratio.

[21] See pp. 193-195.

[22] From one-half to over two-thirds of the school time, as compared with about two-fifths at present given in the Flower Technical High School.

complete curriculum for any of the courses. It is the desire of the authorities to leave some freedom for the development of a curriculum as the needs of the school arise. The school is also at present too new for one to pass complete judgment on its work. Some excellent work was observed by the writer in drawing related to the sewing work, and in botany related to the cooking and to the textiles used by pupils. It is apparently planned to relate all the academic subjects closely to the shopwork and to industrial needs. In sewing, considerable order work is done for individuals and for institutions, and articles are made for use in the school.

Elementary schools

1. In the Farragut Elementary School, industrial classes were started February 1, 1910, with 75 boys and 25 girls, from grades 6, 7 and 8, who were one year or more behind grade. An effort had previously been made to organize industrial classes in this school on the coöperative plan, with pupils alternating between factory and school in two-week periods. This effort failed partly because the boys were unwilling to make the necessary financial sacrifice for the period in school.

The classes are at present, then, essentially for over-age children. Instruction is provided in English, history, arithmetic, business forms and correspondence, drawing, and in woodwork for boys and sewing and cooking for girls. Some instruction in civics is given by way of supplementary reading. About one-third of the time is given to shop and drawing for the boys, and to cooking, sewing and drawing for the girls. Plans are under way to add elementary electrical work, and shopwork in forge and foundry. Classes are not segregated in the academic studies and drawing.

About 75 pupils were in attendance in November, 1910. From 30 to 40 applicants were turned away in September for lack of room. The average age of pupils is between fourteen and fifteen years. Sessions are held 5 days a week, 5 hours a day for one group and 5¾ hours for another group.

Comment. Special effort is made to overcome the deficiencies of the children in the regular academic subjects and excellent progress has been made in this direction. Especially noticeable are the good results obtained in arithmetic by means of frequent drills for speed and accuracy in the fundamental processes, in which the pupils take great interest.

Teachers endeavor to introduce into the academic subjects as much as possible of the applications of these subjects. In arithmetic about fifty problems relating to woodwork have been collected. In history, an elementary study is made of the cotton, wool, linen and silk industries, using for this purpose a number of the current supplementary reading-books on industrial history. In English, some composition subjects are related to shopwork.

In drawing, the boys give about half of the time to working drawings of all projects made in the shop, and the remaining time to the usual mechanical drawing exercises. The girls make the same working drawings that the boys make, and go through the same series of mechanical drawing exercises. It may be noted here that all the drawing for girls in the Albany Vocational School takes the form of design related to sewing and to house planning, decorating, and furnishing. In the Farragut School a very little work in design is given in the sewing period.

In the shopwork for boys the following products have been made:

Cutting board, book-rack, footstool, candlestick, towel holder, handkerchief box, bill file, toothbrush holder, envelope holder, key rack, whisk-broom holder, pot shelf, spool holder, nail box, clock shelf, table mat, mission bench, thirty looms for school use.

The girls' sewing has included the following:

Dish towel, hand towel, sewing apron, cooking apron, flannel and muslin undergarments, gingham dress, gymnasium suit, corset cover, white apron, crocheting.

The shopwork for boys and the cooking and sewing for girls are practically the same in character as the corresponding courses in the regular elementary grades and in the first year of high school. The additional time given to these subjects in the Farragut School serves the purpose of providing more training of the same general kind on the manual side. There is, however, in comparison with similar schools in other cities, little of a distinctly vocational character in this work. Moreover, in other cities from one-half to two-thirds of the school time is given to handwork, including drawing, as compared with one-third in the Farragut School.

The writer is not altogether certain that it is the aim of the school authorities to provide for these classes instruction which is industrial in the sense used in this report — namely, that it shall prepare definitely for vocations. If this is not the aim, it is unfortu-

nate, for these over-age children, most of them more than fourteen years of age, and living in the midst of a large manufacturing district, are precisely the ones in whom the vocational interest is strong and the school interest comparatively weak. If, then, these children are to be retained long in school, instruction must be provided which is distinctly and frankly vocational in purpose, and pupils and parents should clearly understand that such is the purpose of the school. The importance of this point is seen in the fact that of the 93 pupils attending the school in June, 1910, 48.3 per cent did not return in September.

Industrial training, therefore, as distinguished from manual training, would here be appropriate. It is true that the school has been in operation only a short time, and that its full development into a vocational school is at present handicapped somewhat by a lack of room. This lack of room makes it impossible, for example, to provide in the school a dining-room, bedroom, etc., about which the girls' work in homemaking could be centered, as is done in the Albany Vocational School and in the Washington-Allston School, Boston. In planning, furnishing, decorating and caring for such home rooms large opportunity may be found for practical work in the shop, and in sewing, design, arithmetic, English, and a study of materials. Excellent training could also be provided if a school luncheon were given each day, to be prepared and managed by the girls, as at the Albany Vocational School. Even with the present lack of room, however, it should be possible to introduce more work in sewing of a practical character, such as the darning and patching needed in the home.

In the shopwork for boys much more practical work could be done. It should be acknowledged that the present work, for its kind, is well done — the teaching is good. It should also be acknowledged that the shopwork for boys has very little of the character of mere " exercise " work, for the problems of technic are nearly always a part of the making of a complete article for ornament or use in the home or school. The projects made do appeal to the home interest and to a very slight extent to the school interest, but it is questionable whether the objects for home use are made to fill a *real need.* The thirty looms made for school used do fill a real need, and it is here contended that much more of this kind of work could and should be done, to give the shopwork more of the quality of real work to the pupil.

Opportunities must exist in this school, similar to those found in other cities, for basing the shopwork on the general repair work needed in and around school buildings, and on the making of apparatus and other equipment for the schools. Much suggestive work of this character is presented in the lists of projects given in the description of schools in Chapter VII.[23] In some public schools products are also made for sale, and boys are sometimes paid for work done for the school outside of school hours. Girls, too, do order work in sewing, and sometimes sell the products of the kitchen to private families. By all these means the effort is made to give the schoolwork the flavor of real life to the pupils.

It would also be well for some of the woodwork in the Farragut School to take the form of carpentry. If more room were available, the elementary phases of trades using materials other than wood should also be introduced, in order to reach the varied interests and develop the different abilities of pupils. In addition to the electrical and forge work now being planned, the following trades are suggested by the curricula of schools in other cities:[24] printing, tinsmithing, sheet-metal work, plumbing, bricklaying, concrete work, and bench and vise work on metal.

That the more practical, industrial work referred to above is not beyond the powers of the over-age children in the Farragut School is evident from the fact that in the schools where this work is done over-age children are present in large numbers because of the low requirements for admission. It may be added that this more practical work makes it possible to relate the academic studies and drawing to the shopwork, and to the industries in general, in a much more direct and vital way than can be done with the kind of shopwork now offered.

In the Farragut School the opportunity exists to attack the problem of industrial education in Chicago at the most important point — in grades 6 to 8, when the largest number of pupils leave school to go to work, and at the age when the industries offer little or no opportunity for appropriate training. These years are at present largely wasted, both to the child and to the industries. The statistics presented in Chapters II, III and IV show the great need for industrial training at this point. It must be emphasized, however, that if this training is to really attract and hold the pupils, and if it is to

[23] For the methods used in shopwork, see Chapter VIII.

[24] See especially sections 1, 2, 3, Chapter VII.

win the confidence of employers and parents, it must be truly practical in character, it must include the elementary phases of actual tradework, and it must be offered under conditions which approximate as closely as possible the best conditions prevailing in the industries themselves.

2. An elementary industrial course for grades 6, 7 and 8, is authorized in the Course of Study for Elementary Schools adopted June 29, 1911. Graduates of this course are to be admitted to all high-school courses. As shown in Table 23, 615 minutes a week are

TABLE 23. TIME SCHEDULES IN MINUTES PER SCHOOL WEEK[25]

	Industrial course	General course		
	Grades 6, 7 and 8	Grade 6	Grade 7	Grade 8
English, history and civics, mathematics, geography (including special Chicago course), penmanship, nature study	560[26]	795	735	735
Physical education, music, opening exercises, study, general use, recesses	325	435	495	555
Art, industrial arts	615[26]	270	270	210

given to art and industrial arts, as compared with 270 or 210 minutes, in the general course. The 560 minutes allotted to the academic subjects is 175 minutes (nearly 3 hours) a week less in the industrial course than in grades 7 and 8 of the general course.

The work in industrial arts, as outlined for the industrial course, includes the following subjects not outlined for the general course: for boys, venetian ironwork, plumbing, concrete construction, elementary electrical construction, photography; for girls, embroidery, millinery, waitress work.

The outlines of academic subjects for the industrial course are similar, in the main, to those for the general course, with some omissions from the outlines for the general course, and with suggestions that special emphasis be placed upon the industrial and

[25] From the Course of Study for Elementary Schools, adopted June 29, 1911.

[26] For the sake of comparison, the 60 minutes assumed to be allotted to nature study in the industrial course is taken from the industrial arts period and is scheduled with the academic subjects.

commercial phases of the various subjects. In mathematics, an excellent detailed outline is given of sources for problems in the work in household arts.

The statement is made in the Course of Study that the industrial course is, for the present, to be offered only on the special permission of the superintendent, and in districts where the demand is sufficient to call for at least four divisions of pupils. At the present writing no school is actually giving the course.

Comment. The large amount of time (10¼ hours a week) allotted to shopwork and drawing places the Chicago elementary industrial course, so far as the time element alone is concerned, clearly in the class of prevocational courses in the elementary school. The Chicago industrial course, however, should not, in the writer's opinion, be offered to pupils of normal age in grade 6. This opinion is based upon two principles which may be said to be fairly definitely settled in current practice in industrial schools or courses which assign to shopwork and drawing as much as 10 hours or more a week. In the first place, such courses are not in general offered to pupils below the age of twelve. In the second place, the completion of the sixth grade (or of higher grades) is commonly accepted as a standard, on the academic side, for admission to such courses.[27]

These two principles may be defended on several grounds. In the first place, it is questionable whether the interest in vocation is definitely aroused in most cases before the age of twelve, and whether the child is sufficiently mature before that age to undertake with profit the kind of shopwork which should be offered in a distinctly vocational course. Moreover, one of the objects of vocational courses in the elementary school is to develop an appreciation on the part of the pupil of the value of further school training after the compulsory attendance period. If this appreciation can not be aroused in two years, beginning at twelve, it is difficult to see how it could be aroused by beginning one year earlier. Again, it is questionable whether the academic subject-matter as at present outlined and presented in the elementary school should be reduced in quantity to the extent that is involved in the time schedule for the Chicago elementary industrial course. Present practice also assumes that

[27] See Course of Study for Elementary Schools, State of New York, 1910, and the admission requirements for industrial schools, described in Chapter VII of this report. Courses intended primarily for over-age children in the lower grades are not included in the type under consideration. In such courses the aim is mainly to advance the pupil on the academic side, rather than to prepare him definitely for vocations.

the completion of the sixth grade is necessary in order to insure for the academic subjects a degree of mastery of the fundamentals which is needed if the applications of these subjects are to be pursued successfully in vocational courses.

In view of the principles above stated it is therefore the opinion of the writer that the Chicago elementary industrial course should in general not be offered to pupils under twelve years of age, and should be limited to those who have completed grade 6. For the normal pupil these age and grade limits coincide. The over-age pupils at twelve years of age are somewhere below the sixth grade. For such pupils different provisions should be made. They should have the opportunity, no matter what grade they are in, at the age of twelve, of entering an industrial course in which shopwork plays a large part, but which aims primarily, and largely by individual work, to advance the pupils on the academic side as rapidly as possible until the standard of the sixth grade is completed.

In short, the Chicago elementary industrial course by beginning in grade 6 begins too early for the pupil of normal age, and fails to reach the retarded pupils below grade 6 who are twelve years of age.[28]

If, then, we assume that the elementary industrial course should be restricted to grades 7 and 8, it is still unnecessary and unwise to give so little time to the academic subjects as is provided in the Chicago time schedule. With the large amount of time (10¼ hours a week) allotted to handwork, it should be possible to lengthen the school week from 25 hours to 30 hours without bringing undue fatigue upon the pupils. A weekly schedule of at least 30 hours is common in present elementary industrial schools, and is required in the vocational courses in the grammar grades of Fitchburg, Massachusetts [see pp. 162-182, especially p. 164]. In the Farragut School, Chicago, one group of the industrial class attends school 28¾ hours a week [see p. 104]. With a schedule of 30 hours a week, and with 10 hours allotted to shop and drawing, 20 hours would be available for academic subjects, general use, etc., as compared with 14¾ hours in the present elementary industrial course, 20½ hours in grade 7 of the general course, and 21½ hours in grade 8. It should be recognized that just because these pupils are likely

[28] A complete system of industrial courses to meet the needs of pupils from twelve to sixteen years of age, below the academic level of the high school, is presented in items 1, 2 and 3 of the committee's recommendations on pp. 15-21 of this report.

to enter the industries early, it is all the more important to give them as much as possible of the academic training which is enlightening and liberating in connection with their vocation.

In the outlines of academic subjects some general suggestions are given for relating the subject-matter to industrial conditions; in only one subject (mathematics) are specific suggestions given. To a certain extent the kind of academic subject-matter appropriate to such a course can not at present be outlined in detail; it must be developed by the teacher himself as the instruction progresses in close contact with the shopwork. It is, therefore, important in the present experimental stage of industrial courses to have instructors especially fitted for this work and to provide an independent organization of the teaching staff with considerable freedom from conventional academic standards. The outlines of the course of study give no assurance that such an organization is intended, although the possibility of bringing about such an organization is provided for in the statement that "No divisions should begin the work without special permission from the superintendent."

The woodwork for boys, as outlined in the industrial course, is about the same in character as that outlined for the general course. This work should be made much more practical in character, should be given a stronger vocational trend, by requiring the making of apparatus, equipment and other articles of a distinctly commercial standard which are actually needed and put to use in the schools or elsewhere. The remaining shopwork for boys is very slightingly treated in the outlines by merely mentioning the names of the trades to be introduced, such as plumbing, concrete construction, and electrical work, without indicating in detail the character of the work to be done in these subjects. Detailed outlines should be provided for all the shopwork, setting up a definite vocational standard, and avoiding the dilettante work which might be done in the absence of such outlines. Detailed illustrations of the kind of shopwork here in mind are given in the descriptions of schools on pages 162-182 of this report.

Continuation schools

1. The Apprentice Schools were started in January, 1901, and now offer day instruction to carpenter apprentices from January to March, inclusive.

According to the Articles of Agreement between the Carpenters' and Builders' Association, of Chicago, and the Carpenters' Executive Council, of Chicago, Cook County and Vicinity, all apprentices are required to attend some school each year during January, February and March, and while attending school receive from the masters the regular wage provided by the apprenticeship indenture — namely, $6 a week the first year, $7 the second, $8.50 the third, and $11 the fourth year. The apprentices are under the control of the Joint Arbitration Board composed of members of the two associations. This Board exacts fines from the apprentices for non-attendance at school. Of the 417 carpenter apprentices in Chicago, Cook County and vicinity, in November, 1910,[29], 279 were enrolled in the two public schools that year.[30] The average membership in the two schools in 1910 was 222.5.[30] The ages of students range from sixteen to twenty-five years, the average being about nineteen years.

In past years the bricklayers and stonemasons made similar requirements of their apprentices, but these requirements are not now in force.

In the public Apprentice Schools special effort has been made in the 1911 school term to provide practical instruction suited to the needs of the apprentices. Teachers have been sought who have special qualifications for this work. Outlines of a course of study were submitted to the school authorities by the Joint Arbitration Board. Shopwork is offered for the first time in the history of the Schools. The teachers are preparing outlines of the courses in drawing and shopwork. In the academic courses, teachers are endeavoring to present a more practical kind of subject-matter than that which was formerly offered. Since these efforts were started only a short time before the schools were opened they are not yet sufficiently matured to make it possible to present in full detail a statement of the courses to be offered. The following statement of the present tentative plans and of the instruction now given[31] may, however, be made.

Four hours a week are given to shopwork and from 7½ to 10 hours a week to drawing. Since the school sessions are from 31 to 34 hours a week,[32] the time devoted to shop and drawing is about

[29] Statement of president of Builders' Association.

[30] School Report, 1910.

[31] Up to the end of the third week of January, 1911.

[32] No sessions on Saturday.

two-fifths of the total. The academic subjects include arithmetic, history and civics, writing, spelling, English composition and geography.

An effort is being made to grade the work according to the advancement of pupils in the apprenticeship term. To a considerable extent, however, the work is the same for the different apprenticeship years. This is explained in part by the fact that the grading has heretofore been comparatively loose and the present teachers have no record of the stage of advancement reached by the pupils, and in part by the fact that some of the subject-matter now offered is comparatively new to most of the apprentices.

In arithmetic an excellent text-book, *Shop Problems in Mathematics,*[33] was adopted for this year, and is used in all classes.

The history in some classes takes the form of a discussion of current events based on the reading of newspapers, some geography being introduced therewith. In other classes the industrial portions of the regular elementary school text (McMaster's) are used. In one class that portion of McMaster's text is used which deals with the Constitution and Articles of Confederation. In still another class the general history of the United States is followed, outlined by presidential administrations.

The civics is likewise presented in some classes in connection with current events in newspapers; in other classes the current elementary texts are used. It is worthy of note in this connection that instruction on trades unions and builders' unions was recommended in the course of study prepared by the Joint Arbitration Board. In one school some instruction is now given on the organization and relations of these unions.

The geography is largely commercial in character, the material being obtained from the commercial portions of the regular elementary school text (Dodge), and from Adams' *Commercial Geography.*

In English some excellent work is done in writing compositions on specifications and contracts, building laws, business forms, notes, etc.

In drawing, a notable improvement is made this year in the elimination of many of the formal exercises previously given and in the introduction of more practical work in estimating quantities and cost of material, in specifications, strength of materials, and

[33] See p. 216 for an outline of this book.

building laws. All the drawing instructors have had practical experience in architectural drafting.

In the shopwork there is at present a difference of opinion as to what the content of the course should be. The tentative outlines prepared by the instructors include, for both schools, the care, use and sharpening of tools, and carpentry work in house framing, roofing and stair-building, with the addition, in one school, of interior woodwork and finishing, and in the other, of cabinet-making and finishing in hardwood. The representative of the Joint Arbitration Board, however, has criticized this work, on the occasion of a visit to one of the schools, saying that instruction in actual carpentry was not needed in the school shops, because this instruction was provided "on the job." In his opinion only the finer work with tools should be given in the school shops, but he failed to state what that work should be. As a consequence of this criticism the shopwork in this school seems to be tending, for the present term, in the direction of the conventional manual-training work. The work begins with the usual "exercises" designed solely for the development of fine technic — the planing of a small piece of board "perfectly true, square and smooth," and gauging and sawing to "perfect" dimensions. After these exercises it is apparently contemplated to proceed to the making of book-racks, lamp-stands, candlesticks, glove boxes, tabourets, etc., and, perhaps, into patternmaking.

In the other school the shopwork starts at once on stair-building. The first and second year apprentices are to spend part of the term on the elementary phases of this work and will later take up house-framing and roofing. The third and fourth year apprentices are to spend the entire term on the building and finishing of stairs. In this school instruction and practice in technic and in the use and sharpening of tools are given as needed in the progress of the work.

Comment. The Chicago Apprentice Schools were probably the first public day continuation schools for trade apprentices to be established in this country. The only other school of that character, so far as the writer knows, is the Cincinnati Continuation School for machinist apprentices,[34] established in September, 1909. Commercial schools of the day continuation type were established in the Boston public schools in April, 1910.[35]

In Boston and Cincinnati the students receive full pay from

[34] See p. 200.

[35] See p. 201.

employers while attending school. In Chicago the apprentices receive while attending school the regular wage called for by the apprenticeship indenture, but some apprentices receive a higher wage when working at the trade. In Munich, Germany, the apprentices are paid in some cases while attending continuation schools.[36]

The Chicago Apprentice Schools have about 1,600 hours at their disposal for the four-year apprenticeship. The Cincinnati school has about 832 hours, and the continuation school for the building trades in Munich, Germany, has about 910 hours for the three-year course.[37] The Chicago schools have, therefore, nearly twice as much time at their disposal as the Cincinnati school, and about three-fourths more than the Munich school. Moreover, since the apprentices in the Chicago schools are taken from the tradework for the entire three months of the school term, there is, apparently, no reason on the side of the apprentices why they should not be required to spend the same number of hours a week in school that they spend at the trade when not in school — namely, 44 hours. This plan would afford a total of about 2,112 hours for the four years, about one-third more than at present, and about two and one-third times as much as the three-year course in the corresponding school in Munich.

Chicago thus has an exceptionally good opportunity, with respect to the conditions above noted, to provide instruction of the day-continuation type in the Apprentice Schools already established. There has been much discussion, in the newspapers and elsewhere, over the importance of starting day continuation schools in Chicago, apparently overlooking the fact that an excellent start had already been made so far as external organization is concerned.

But a comparison of the instruction offered in the Chicago schools previous to the present term, with that offered in the continuation school for the building trades in Munich, Germany,[38] leads one to conclude that Chicago has not risen to her opportunity, in this respect, as adequately as she might. The Cincinnati and Boston schools, while yet in their infancy, are making earnest efforts to provide practical instruction closely related to the students' needs.

[36] Statement in *Organisation und Lehrpläne der Obligatorischen Fach und Fortbildungs-Schulen für Knaben in München*, 1910.

[37] See p. 200 and p. 119 ff. The time given to the subject of religion in the Munich schools is not counted in this statement.

[38] See p. 119 ff. Detailed outlines for the Trade School for Carpenters, Amsterdam, Holland, and the School for Carpentry, Brussels, Belgium, are given in the *Second Annual Report of the Massachusetts Commission on Industrial Education*, January, 1908, pp. 335 ff. and 376 ff.

The Apprentice School conducted by the Chicago Young Men's Christian Association[39] has also developed some good work.

The Chicago Apprentice Schools have been in operation ten years, but apparently no thoroughly organized effort has been made before the present year to work out in detail a curriculum in which the needs of the apprentices is made the center. With the exception of drawing, the instruction has been much the same in character as that given in grades six, seven and eight of the regular elementary school.

Even the drawing has lacked the practical character needed in a course for carpenter apprentices. In the academic studies comparatively little was done by way of introducing applications to the building trades. What was offered of this practical character was what the individual teacher happened to have at his command out of his previous experience. One teacher went so far as to say "it practically amounts to nothing." Another teacher, in his three years of service in the Apprentice Schools, had accumulated a considerable number of practical problems in arithmetic, and in the third year of his tenure presented some valuable instruction on plans, specifications and estimating. But no permanent record of this work was made, in a detailed course of study, and when he left the service the value of this work was lost for the future of the school.

In short, the Apprentice Schools have been allowed to shift largely for themselves, with reference to the adaptation of the instruction to the special needs of apprentices. New teachers have had to find out from the pupils themselves what subject-matter was covered in preceding years, and it was largely a matter of chance that suitable instruction of a practical character was occasionally offered.

The result of this condition is what one would naturally expect — a lack of interest on the part of apprentices, testified to by teachers and others, poor attendance,[40] and some difficulty with the discipline. The fact that about fifty building-trade apprentices attend the Y. M. C. A. school, and that some carpenter apprentices attend Lewis Institute, Armour Institute, and the Chicago Technical College,[41], in all of which schools tuition is required, may or may not indicate dis-

[39] See p. 140.

[40] The percentage of attendance in 1910 was 88.1, which was lower than that for any other division of the Chicago public schools except the kindergartens, according to the School Report, 1910.

[41] Statement of the president of the Carpenters' and Builders' Association.

satisfaction with the public schools in the past, but the fact is at least worthy of consideration.[42]

The present efforts to revise the course of study in the direction of more practical work deserve commendation. There are now some places in which the courses overlap, and there is a certain lack of correlation among some departments. These deficiencies are, no doubt, due to the newness of the course of study and should, in time, be overcome.

Because of the practical character of the subject-matter needed in the Apprentice Schools, and because of the shortness of the course, it is especially important to provide a curriculum outlined in considerable detail and graded throughout to correspond to the apprenticeship years. This is also desirable because of the frequent changes of teachers and principals, which are seemingly unavoidable under present conditions.

There is an apparent difficulty in the way of such a grading of the courses, arising from the fact that apprentices come to the school with varying degrees of academic preparation. But this difficulty would largely disappear if the course were related to industrial needs as closely as it should be. An excellent example of such a course of study is the one for the continuation school for building-trade workers, Munich, Germany, a translation of which is given below [page 119 ff.]. With the larger amount of time available to the Chicago schools they should be able to cover considerably more ground than the Munich school.

Since the course of study for the Apprentice Schools is now in an early formative stage, some suggestions, based on a study of the work of the schools and of industrial schools in other cities, may not be out of order.

(a) The courses in history and geography now offered, in so far as they are industrial, are so in a general way very largely. No provision is made, so far as could be learned, for a study of the history and geography related in a very intimate way to the building industries. To a considerable extent it should be possible, and it is desirable, to start with a concrete study of the history-geography of the building industries and then branch out into the more general industrial and into political and social phases. It would be desirable

[42] The criticism of the former work of the schools is based on visits to the schools by a representative of the committee, and on interviews with three former principals and with five teachers.

also to include a history of unionism and the mediæval guilds in connection with the instruction on trades and builders' unions proposed by the Joint Arbitration Board.

(b) A much closer correlation than at present exists should be made between drawing and shopwork. The outlines of the course of study for the Munich continuation school, given below, are suggestive in this direction. The writer understands that this matter is now being considered by the school authorities.

(c) There should be no hesitation in providing actual carpenter work in the school shops. The apprentices themselves are eager to get such instruction. A number have stated to the writer that it is exceedingly difficult to get adequate instruction "on the job," unless the apprentice is associated with his father, who takes an interest in his advancement. It is well known that this difficulty prevails generally under modern industrial conditions. Last year a petition was presented by the apprentices to the Joint Arbitration Board asking for instruction in shopwork, including the use of the steel square. Again this year a petition was presented by apprentices in the school not now offering carpentry asking for instruction in the use of the steel square. The writer can testify to the greater interest displayed by the apprentices in the school which starts with actual carpenter work, as compared with the school which starts with formal exercises in technic.

(d) More than 4 hours a week for shopwork could be used to advantage. A 44-hour week for the schools, with Saturday morning sessions, would be desirable.

(e) The difficulty experienced in securing for the more technical phases of the work instructors who have expert first-hand knowledge of building conditions suggests the advisability of seeking the coöperation of employers and workmen in securing such instructors. Since the Apprentice Schools are in session only in the dull season for the building trades, this coöperation should be readily obtained.

(f) Many of the obstacles now in the way of the full development of the Apprentice Schools could be overcome if the course were extended to include instruction for apprentices in other trades in the autumn and spring. The machinist trade for the autumn quarter and the plumbing and steam-fitting trades for the spring quarter have been suggested. Full legal authority for such addi-

tional schools exists in the following quotation from the Illinois State law, approved May 15, 1903.

> In all municipalities where a manual-training school is maintained for the technical instruction of apprentices, such indentures shall further provide that it shall be the duty of the master to cause the apprentice to attend such school for at least three consecutive months in each year without expense to the apprentice.[43]

(g) It is unfortunate that apprentices in the bricklaying and stonemason trades are no longer required to attend the Apprentice Schools, for the three building trades form a natural group with closely allied interests. A combined course of study similar to the Munich course given below could be prepared which would be of greater value to a particular trade because of its relations to the other two. If a thoroughly practical course of study were arranged for the three trades it is not unlikely that the bricklayers and stonemasons could be persuaded to resume their former relations to the schools.

(h) The per capita cost of the Apprentice Schools in 1910, for teachers' salaries only, was $12.72.[44] Reduced to a ten-months basis this gives $42.40, compared with $25.85[44] for elementary schools and $70.65[44] for technical high schools. Since the apprentices are older than the high-school students it would not be inappropriate to pay at least as much for technical instruction in the Apprentice Schools, if necessary, as is paid in the technical high schools.

The following is an outline of the organization and course of study for the continuation school for building-trade workers in Munich, Germany:[45]

Principles of Reorganization

a. The trade school for workers in the building trades comprises, corresponding to the term of apprenticeship of the pupils, three progressive yearly classes, instruction in which is given during the period from September 15 until July 14 in each year.

b. Attendance at these classes is compulsory for all masons', stonecutters' and carpenters' apprentices during the entire period of their apprenticeship, or until the completion of the eighteenth year of their age.

c. Instruction is confined strictly to the above-mentioned trades,

[43] From Hurd's Statutes.

[44] School Report, 1910.

[45] The translation is taken from Bulletin No. 14 of the National Society for the Promotion of Industrial Education, New York. An outline of the Munich continuation school for unskilled workers is given on p. 204 ff.

and includes the following subjects: Religion, Business Composition and Reading, Trade Arithmetic and Bookkeeping, Hygiene and Civics, Trade Drawing and Practical Instruction in Materials and Tools.

d. The hours of instruction are ten per week in all three trades during the winter semester, that is, from October 15 to March 15; and during the summer semester, that is, from March 15 to October 15, six hours. In the winter these hours fall on a single workday from 7 to 12 o'clock in the forenoon and from 2 to 7 o'clock in the afternoon; and in the summer, on the afternoon of a single workday, from 1 to 7 o'clock. Care is to be taken, however, that apprentices of different grades coming from the same concern do not attend school on the same day.

e. The course of study is distributed as follows over the three school years and the respective ten and six hours of instruction:

Subject	Hours per week in the three classes: In winter semester	Hours per week in the three classes: In summer semester
Religion	1	1
Business composition and reading	1	1
Trade arithmetic and bookkeeping	1	1
Hygiene and civics	1	1
Trade drawing	3	2
Practical instruction in materials and tools	3	..

f. The instruction in drawing and the practical instruction in materials and tools is to be imparted by craftsmen; the remaining instruction is to be given by the trained teaching staff of the public and continuation schools of Munich. It is, however, provided in advance that all the teachers shall be in very close touch with the trades, so that, with a view to practical application, they may be familiar with trade requirements.

g. The defrayal of the expenses of instruction, as well as the provision of the necessary classrooms, remains as heretofore the duty of the community of Munich.

h. The Guild of Master Builders, Masons, Stonecutters and Carpenters announces its willingness to undertake to supplement the supply of wood and plaster models for the drawing instruction or of observation models for the instruction in materials, where such need shall at times arise.

Scope and Distribution of the Subject-matter of Instruction

The subject-matter of instruction, with regard to the vocation of the pupils, shall accord with the following schedule:

a. **Religion.** Lessons following the regulations of the Archiepiscopal Inspectorate, or the Protestant Superior Council.

b. **Business Composition and Reading.** The instruction in Composition aims at preparing the pupil to draft with grammatical, orthographical and formal correctness all of the more important forms of private

and business correspondence. **Class I.** Ordinary private letters to members of the family, relatives and friends, relating to events in the life and vocation of the pupil; inquiries and replies, applications for employment, announcements, statements of acceptance, declinations, indentures. (In connection with this, postal forms.) Compositions on the subjects of hygiene and materials. **Class II.** Compositions on matters of purchase and labor: written and open bids on building materials, inquiries as to prices, orders for goods and labor, purchase and labor agreements, business instructions, delivery notices, bills, cash payments, receipts, part payments, refusal of payments and suspension of payments. (In connection with this, the procedure of the money and parcels post and of the freight traffic.) Complaints, excuses, opinions, certificates, recommendations. Compositions on the subject of materials. **Class III.** Compositions on the subject of indebtedness; shipments of goods on credit, certificates of indebtedness and security bonds, dunning letters, claim letters, letters of respite, abatements, correspondence on bills of exchange, drawing-up of mortgages and notification on same. Correspondence with officials: petitions to magistrates, to the city building commissioner, state building officials, commercial and industrial commissions, the government and trade tribunals. The instruction in reading is intended above all to promote the general and moral education of the pupil. It is also designed to arouse the pupil's interest in the best literary works. For this purpose the school library is also to be utilized, and now and again a classic poem should be read. In order to further the above objects, the teacher in each class is to make a suitable, systematic choice of appropriate selections.

c. **Arithmetic and Bookkeeping.** The instruction in arithmetic has for its object primarily to impress on the pupil the necessity for acquiring a thorough system of private and business accounting and to instruct him in the proper method of conducting the same. But in addition it shall prepare the pupil to make, with as much self-dependence as possible, the more simple calculations of cost and estimates, and in particular it shall ensure his adequate skill in special building calculations. The work in arithmetic for the three classes is arranged as follows: **Class I.** Personal accounts: earnings and living expenses of the building-trades workman; reckoning of hourly, daily and weekly wages, wages ledger and pay-roll, monthly and yearly income, comparison and equalization of summer and winter earnings; the daily, weekly, monthly and yearly expenditures of an individual, of a family; household expense book, monthly and yearly balances. Calculations of percentages: savings accounts and interest (various methods of calculating interest, up to absolute accuracy). Geometrical calculations with direct reference to problems in building, exercises in lines, simple surfaces and solids (square, extraction of square root, rectangle, cube, four-sided prism), calculation, especially of extent of walls on metric system, old-style measurements and their conversion (foot, square foot, land measure, decimals). **Class II.** Geometrical calculations, extension of the work in surfaces and solids (rhombus, rhomboid, trapezium, triangle, Pythag-

orean theorem, triangular prism, circle, circumference, cylinder, hollow cylinder, pyramid, and cone and sphere, with special application to examples from masons', stonecutters' and carpenters' practice). In connection with the above, practical calculation of weights. **Class III.** a. Business accounts: with the instruction of this class in business accounts is connected the bookkeeping, as far as its formal completion can be effected in the classroom. Purchase of building materials, purchase and sale of land and buildings, with accompanying profit and loss, calculation of averages and more complicated problems in percentage. Work by the day and jobwork, including partnership calculations, transportation of building materials and outfit, sundry other trade calculations. Cost-figuring for building trades. Calculations and estimates of a simple character. Liquidation of debt, instalment calculations, computing the value of financial paper, notes and checks, calculations of tax and insurance.

d. **Hygiene and Civics.** The instruction in hygiene and civics has the purpose of familiarizing the pupil with a rational way of living, physical and intellectual, and consequently relates on the one hand to sanitary matters, with special consideration of workshop hygiene; on the other hand, it deals with the duties of life in the vocation, the community and the state, and above all else, with those affairs from which the pupil will most quickly gain a recognition of the necessary interdependence of interest of all social and industrial groups. **Class I.** a. The apprentice: admission to employment, indentures. The workshops and factories from the hygienic aspect, the observance of cleanliness. b. Deportment: behavior at home, in the school, toward fellow workmen and employers in the workshop, on the street, in social gatherings. c. Hygiene: construction of the human body in general, nourishment, food and food luxuries, according to their value or uselessness. Respiration and the circulation of the blood. Lodging and clothing. Work and recreation, care of the sense organs and nervous system. First aid to the injured, practice in bandaging. **Class II.** Trade history: development of architectural plans and processes, especially in Germany; in connection therewith, the conditions of the building-trades craftsman; masters who have been prominent in the building trades. The development of the building-trades guild in Munich from the fourteenth century to the present time; trade guilds and associations, the free corporation. **Class III.** The most important features of trade organization. Journeymen's and masters' examinations. Workmen's protection and social legislation. Trades Council. Trade arbitration. Trade tribunals. The building-trades craftsman as a member of the community. Community organization. Problems of the community. Honorary offices of the citizens of the community. The building-trades artisan as a citizen of the state. The state constitution of Bavaria. Objects of the state organization. Honorary offices of citizens of the state. Government of the Bavarian Kingdom. Duties of the state authorities. Constitution of the German Empire. Trade and commerce in modern times and its importance to the welfare of the citizen. Competition. Allied

trades. The importance of labor in the state. The interconnection of trade interests. The value of the German foreign consulate.

e. **Drawing.** The instruction in drawing is intended to impart to the student, in addition to the greatest possible accuracy and dexterity in the use of drawing tools, the capacity for presenting clear and intelligible drawings of individual masonry, stonecutting and carpentry operations and constructions, as well as for drafting simple sketches of plans correctly and preparing original plans. He must, therefore, be made acquainted with the various methods of drawing and coloring. Where it appears practicable, the student's comprehension of his work shall be promoted and tested by the execution of working plans, or the isometric reproductions of single parts. A further feature of this instruction is to be found in the arousal and increase of the interest of the pupil in the buildings and architectural affairs of the city, as well as of his aesthetic and artistic taste in general. The instruction is divided into mechanical and freehand drawing. The latter is in every respect to be so planned that, wherever possible, it shall support and supplement the former; in all classes, as far as possible, practice is to be given on designs or models that are actually used in the trade. The general principles of drawing that prevail in all trade schools are to be kept in view. The subject-matter of instruction is as follows:

A. **Masons: Class I. Geometrical and projective drawing.** The most important geometrical elements, with constant reference to their technical execution and their application to practical examples of masonry; linear designs, erection of perpendiculars on a brick wall, line division for a wall design, metrical measurement for a pedestal with reduction to scale, angle division for a crown arch. The circle and its elements in a round window. Finding the center point for arch construction, circular division and polygons in a chimney plan. Tangential theory in door and window plans. Diminished arch for a church window. Ellipse in a house entry. Building-stone measurement. Patterns for facing walls. **Class II. Technical drawing** (from models only). The elements of mouldings and their combinations to form mouldings. Simple solids used in building done in horizontal, vertical and side projection, and horizontal and vertical cross sections of the same; isometrical representation of single building stones and simple elements of building construction. The different styles of wall bonds (stretcher, binder, English and lateral bond), wall angles, joining and crossing walls; chimneys, hollow walls, buttresses. Construction of main and partition walls for several adjoining apartments. **Class III. Technical drawing** (from models only). Irregular forms of walls; arch construction in brick (crown, depressed, round, flat, pointed and relief arches), their form-stones and mouldings. Decorative work on windows and doorways. Simple dome construction; simple lunettes. **Freehand drawing:** in freehand drawing for masons and stonecutters the object is, in all three classes, to impress the principle that only such decorative work is of value and artistic importance as answers a constructive purpose or which is designed to give the building and its

surfaces rhythm, articulation and graceful proportions. For this reason no model is to be drawn, unless its connection with the whole is clear to the pupil. Besides, there can be selected as models simple serial ornaments for wall bands and parts of mouldings; various fillings for square, rectangular, circular and oval wall surfaces, for wall friezes and pilaster strips, for window casings, etc.; simpler and more ornate foliage and flower forms for templet work or ornament; spiral scrolls and their decoration, their use in consoles, keystones and gables. Coats of arms, shields and cartouches for facade ornamentation.

B. **Stonecutters: Class I. Geometric and projective drawing.** The geometric elements, with constant regard to their practical-technical execution and their employment in stonecutting: line patterns, laying-out angles from a stone base. Line dividing on a free-stone wall, scale and transfer of scale on a stone pedestal, angles and their division in bossage or a window lintel. The circle and its parts, finding the center of a segment arch or a circular window. Circular division and polygons in a stone filling. Tangent problems in a torsional twist in a window scale. Basket handle arch for a church window. Ellipse on a bridge arch. Spiral in a stairway. **Class II. Technical drawing** (from models only). Moulding details and their combination into mouldings. Simple forms of stones in ground, front and side plan. Cut forms and isometric representations of the same. Cut-stone bonds, building them into brickwork. The various types of arch construction (crown, depressed, round, pointed and elliptic arches, smooth and serrated arches, coupled arches). Pillars, railings and balustrades. Simple projections. **Class III. Technical drawing** (from models only). Patterns of garden pillars and columns. Base, belt and main moulding courses and building them into brick walls. Round and pointed arch moulding. More ornate window and doorway construction. Niches. Free and wall curbs. Simple open steps. Projection of complicated stones. **Freehand drawing:** for each of the three years there is a systematic selection of suitable patterns in stone sculpture, adapted to the proficiency of the students in drawing, such as egg and leaf-stem mouldings, other serial ornaments, various fillings in friezes and pilaster strips, in stone bases and pediments, in door and window scrolls, in balustrades and other railings. Stone volutes and their ornamentation. Scroll, leaf and flower work for wall surfaces, door jambs, capitals and key-stones. Foliage and fruit scrollwork, arms, shields and cartouches as facade decorations, for pilaster and pillar ornament, decorative columns, simple animal forms and allegorical figures, lettering.

C. **Carpenters: Class I. Geometrical and technical drawing:** elements of geometrical drawing, with constant regard to their technical execution and application to carpentry. Line patterns and laying-out of rectangles. Line division in board and picket fence. Metric measurement, reduced scale, and transfer of measurements on a wooden column. Angles and their division in a garden gate. The circle and its parts in a roof window. Circle division and polygon in a well enclosure. Tangent exercises on a sawed-out gable. Three-centered arch in a window

frame. Ellipse for a gallery. Moulding elements and their assembly. **Class II. Technical drawing:** simple wood solids done in horizontal, vertical and side projection, cross-sections of the same, their design in isometrical presentation. Beam joints (running joint, tie joint, mortise joint, dovetail joint, skew-notch joint, upper strut, hanging tie, strut frame — all from models). Close-walls, balconies. Simple doors and gates. Centering. **Class III. Technical drawing:** roof plans, location of beams, simple raising. Roof-prop parts. Roof-prop details at the eaves, at the intermediate purlins, at the ridge (by use of models). Jack rafters. Simple roof supports: standing, lying purlins, collar-beam and truss-frame roofs, dormer-window plans. Plans for simple stairways. **Freehand drawing:** adapting the various exercises to the drawing ability of the students during the entire three years' course, a suitable and systematic selection is made from the manifold forms of beam and board ornamentation: various patterns of hanging tenons, upper-strut and beam-head decorations, tappets, coronas, barge, verge and hanging boards. Other kinds of sawed work. Simple carved panels of smaller and larger dimensions. Sketches of details of peasants' houses obtained on walking excursions.

f. **Practical instruction in materials and tools:** the object of this instruction is to familiarize the student with the most important tools, instruments and machines of his trade, and with the appearance, properties and varieties, the relations and comparative prices, the proper manipulation and the practical use of the materials used in the trade. This instruction is designed especially to fit the student for making correct estimates, and for this reason as close a connection as possible is to be made with the instruction in arithmetic, in order to have it become a real aid in estimating. The lessons include the following subjects, given separately for the three trade branches of the school, and related in matter as closely as possible to the given field:

A. **Masons: Class I.** Purpose of the school workshop: general idea of building; lessons on tools: scaffold building; instruction in brickwork bonds (English and lateral bond, partly with model stones, partly in the form of dry masonry, with bricks and sand). **Lessons on materials:** lime, lime slaking, preparation and hardening of air mortar. Bricks: face bricks, moulded, perforated and arch bricks, Dutch bricks, paving tiles, flags, roof tiles, earthenware pipe, chamotte clay and stone. **Class II.** Instruction in bonding acute and obtuse wall angles, as well as bonded-in walls and piers. Suavian and Dutch bond, herring-bone bond. Exercises in English and cross-bond with adhesive material. Lessons on materials: cement (its production, properties and application, Roman and Portland cements), concrete, concrete moulding, plaster and its use; wall decay by efflorescence (its cause and prevention); wood fungus (its cause and prevention); sand, gravel (river and pit sand); the natural building stones: limestone, sandstone, volcanic stones (trass, from near Nordlingen), granite; gompholite (its origin). **Class III.** Masonry with facing stones, masonry of chimneys and arches with practical exercises. Arch masonry work. Setting of window and

door uprights. Caulking the interstices of window uprights with excelsior or similar material. Protecting structural parts from climatic influence. Setting and building in overload supports. The finishing coat. Its preparation with lime and cement mortar (inside and outside finish): mouldings with bends, etc. Explanation in regard to the nature and construction of foundations. Anchoring and under-pinning the structural parts. Preparation, clearing the ground, etc., for quite simple rectangular buildings. Method of constructing simple firing contrivances (washfire places, country baking ovens). Steps for the protection of wood against danger of fire. Suggestions regarding drainage arrangements of buildings. Rabitz, Monier and plaster-board walls. Concrete ceiling. Covering of iron parts.

B. **Stonecutters: Class I.** Explanation of the tools used by masons and stonecutters. Various lifting apparatuses (from the iron crowbar to the devices for power operation). Setting up scaffolding. Setting into the brick masonry bond (English bond with three-quarter and split stones). Practical exercises in slaking lime and building (foundations, carrying out of stairways, setting cut stone). Working cut stone (practical exercise on an easily cut stone and one more difficult to cut, limestone and granite), gurletted, chiselled, granulated, axed, smoothed and polished. **Instruction in materials:** properties, production and uses of bricks; properties, production and uses of air or white lime mortar. Quarries and quarry operation. Masonry of unfinished and cut stone. Concerning the setting of cut stone, limestone and varieties of gypsum. **Class II.** Stone-working machines. Pneumatic chisel, lathes, rubbing machines, etc. Practical exercise in making setting-joints (explanation of stonecutting). Exercise in stonecutting on plaster models or soft stones. Working on model in granite (entry steps, steps without profile, end step with nosing, main-exit steps with pedestals, steps with profile). Models in limestone (simple stonecutting, various mouldings). **Lessons in materials:** all the stones occurring in nature, with regard to their applicability to building (granite, limestone, sandstone and volcanic stone and clays, e. g., pozzolana, terranova, etc.). **Class III.** Practical exercises: splitting and working up of simple and complicated stones (for instance, core arches, wagon vault and groined vaulting), first of all in gypsum. Making of various springers and keystones in limestone. Making the necessary wood forms for core arches. Making core-arch springers of granite. **Lessons on materials:** plaster mortar, water, hydraulic or cement mortar; the cements (Roman and Portland cement) in greater detail. Concrete and artificial stone.

C. **Carpenters: Class I.** Tools and instruments. Practical exercises, first of all in the use of tools. Technology of wood: wood as building material; its growth, properties, varieties, defects and diseases (wood fungus, its origin and prevention). Felling and further working-up of wood into cut goods. Priming and impregnation of wood. **Class II.** Exhaustive consideration of the domestic varieties of wood: fir, pine, spruce, larch, summer and winter oak, red and white beech, maple, ash (woods more rarely used: alder, lime, elm, birch, poplar,

willow, pitch pine). The utilization of these woods according to their properties. The most important fruit trees and foreign building woods. Wood-working machines. In the practical exercises, making of the various simple wood joints, always in connection with the drawing instruction. Concrete moulds. **Class III.** Extension of the practical instruction to include the more difficult joints, beam setting and roof joining, according to the ability and advancement of the individual students. Note.— The practical instruction for the third and fourth classes is related to the drawing lessons in the respective classes.

2. Evening continuation classes. Beginning with the winter of 1909, certain buildings used for evening instruction have been given over exclusively to industrial classes with the object of enabling principals and teachers to give their attention exclusively to the problem of making this instruction of more practical value than formerly to persons at work during the day who have left school at an early age. Recently, more teachers with practical experience in commercial shops have been added, temporary teachers' certificates being granted for this purpose.

This tendency to make the evening industrial classes more practical is in line with the development of such courses in other cities, and in general it may be said that the industrial courses offered compare favorably with similar courses in other cities. Of the three technical high schools in which such instruction is now offered, excellent work is being done in at least one which was observed by the writer. The principal of this school reports that 2,265 students were in attendance the opening night,[46] the machine and electrical shops being so crowded that an extra session had to be provided at 5:30 in the afternoon to accommodate the overflow. The large attendance in this one school when compared with the combined enrolment, the first week, of about 3,000 in the three schools a year ago,[47] shows the increasing popularity of these courses, and seems to indicate that further development and extension of the evening industrial courses would be desirable.

3. Further provisions for day continuation classes. The school administration has recognized[48] the need and the importance of making further provisions for continuation schools and classes, especially for part-time day classes for the younger persons already at

[46] Autumn, 1910.

[47] Statement of the Assistant Superintendent of Schools.

[48] School Reports, 1909, 1910.

work. Only the more capable and ambitious, and the older[49] persons are attracted to the evening classes: "It is beyond the resources of the average boy, whether in body or character, to give up two hours an evening for half the year in a desire to better his training, and yet the city ought to do something for the average boy and girl. It is deplorable to see a boy enter upon what has been described as a 'blind alley' occupation, an occupation where he will be no further ahead at eighteen than when he begins work, where he will receive no training for advanced work, and where he may look forward to an entire life without betterment. The Board of Education should furnish opportunity for all pupils to better their condition, and this can be done by offering the right kind of continuation schoolwork."[50]

But the coöperation of employers, necessary for the part-time day classes, has not been forthcoming, although efforts[51] have been made to secure such coöperation. The Board of Education has even considered the plan of securing State legislation requiring employers to cause their employees between fourteen and sixteen years of age to attend school from six to ten hours a week.[52]

While it may be admitted that the complete coöperation of employers will not be secured without compulsory legislation, the experience of other cities indicates that a good start might be made without such legislation. The following suggestions may be drawn from the experience of these cities with the coöperative plan in the public-school system.

(a) The alternate week plan of coöperation is most likely to succeed on the high-school level, and in connection with school instruction distinctly technical in character, preparing for positions of responsibility above that of the actual mechanic. For employers can hardly be expected to give full pay for half-time, and the financial sacrifice thus demanded of students limits the alternate week plan to those students who are able and willing to make the sacrifice and who have the ambition and the necessary academic preparation

[49] Of the 20,699 students in evening classes, 1908-9, 64.3 per cent were over eighteen years of age, 41.8 per cent were over twenty-one (School Report, 1909).

[50] School Report, 1909, p. 89.

[51] Offers to assist in securing the coöperation of employers and unions were made by the Association of Commerce and by the Federation of Labor (School Report, 1909). Efforts were also made to secure the coöperation of manufacturers in sending boys to the Farragut Elementary Industrial School on the alternate two-week plan. The latter effort failed partly because the boys were unwilling to sacrifice half of their wages for this purpose, according to a statement of the Assistant Superintendent of Schools.

[52] School Report, 1909.

to profit by technical instruction leading to advanced positions. Such students are most likely to be found on the high-school level.[53]

(b) The experience of Cincinnati and Boston shows that large numbers of employers are willing to give from four to fifteen hours a week to their employees, on full pay, for day continuation instruction very definitely related to the daily work. In Cincinnati many of the employers coöperating are convinced that the increased efficiency resulting from such instruction more than compensates for the time taken from shopwork.[54] Officers of the New York Central Railroad Company also testify that shop production is actually increased as a result of their apprentice schools, although four hours a week are taken from shopwork for the academic studies and drawing.[55]

(c) Most of the successful efforts at coöperation have been made through associations of employers and workmen, and have been accompanied by the appointment of advisory committees of employers and unions to secure their continued interest and their criticism and advice on the work of the schools.

(d) Provision should be made for some kind of supervision by the school of the work of the students while in the factory.[56] There are two reasons why this should be done: first, to enable the school to relate its instruction as closely as possible to industrial needs and conditions; second, to afford some protection to the student against possible exploitation by the employer, to see that the student advances on the shop side of his training as rapidly as his ability permits.

It should be added that one obstacle to the adoption of the coöperative plan is the lack of confidence on the part of employers in the immediately practical value of the school instruction, due to the hesitancy on the part of the schools to provide the practical instruction needed. This difficulty was pointed out in the Superintendent's Report, 1910, and a step forward was suggested by way of providing more skilled shop instruction in evening classes. It may not be amiss to add that a specially favorable opportunity is

[53] The alternate-week plan is in operation in Fitchburg and Beverly, Massachusetts, Freeport, Illinois, Lewis Institute, Chicago, and is under consideration in Cleveland and Cincinnati, Ohio, Worcester, Massachusetts, and Moline, Illinois. In all of these cases the plan is confined to high-school students, except in the Beverly Industrial School, which admits graduates of the sixth grade, and in the Lewis Institute Coöperative Course, which enrolls, out of a total of thirty-six students, only five who had not completed the eighth grade.

[54] See p. 201.

[55] See *American Engineer and Railroad Journal,* July, 1907.

[56] For a discussion of forms of supervision now in operation, see pp. 150, 151.

presented in the Apprentice Schools and in the Farragut Industrial School to win the confidence of employers and workmen, alike, by making the instruction in these schools practical in character.

The generally favorable attitude of employers toward industrial schools, as shown in Chapter III, and the definite offers of coöperation made in the comments of some individual employers, indicate that properly directed efforts to secure voluntary coöperation might not be wholly unsuccessful. Furthermore, the coöperation of employers already secured in two of Chicago's schools — Lewis Institute and the Apprentice Schools — at least gives faith that what has been done might be done again.[57]

4. State legislation. Some interesting legislation bearing on continuation schools is shown in the following provisions of the Ohio compulsory education law, in effect, May, 1910.[58]

Boards of Education are authorized to establish part time day schools for those who are at work, and then *may require* all who have not completed the eighth grade to continue their schooling until they are sixteen years of age. Those who are at work *may be required* to attend eight hours a week between the hours of eight A.M. and five P.M. Those who are not employed are required to attend school full time until they are sixteen, no matter what grade they have reached.

The Board of Education of Cincinnati has adopted a resolution to provide "Continuation Schools" to meet the provisions of the law, and therefore all certificates to work hereafter granted will be with the condition that the Board may require attendance at school eight hours a week.

The law expressly provides that certificates to work are to be given only to youths, between fourteen and sixteen years of age, who have *completed the fifth grade.* Pupils must present to the Superintendent of Schools a written statement from an employer agreeing to give the child legal employment, and *to return to the Superintendent of Schools the "certificate" within two days after the child's employment shall cease,* with the reason for the withdrawal or dismissal.

Any child between fourteen and sixteen years of age who ceases to work must report at once to the Superintendent of Schools; and said child must be returned to school if employment be not found in *two weeks.*

[57] Since the above was written, the coöperative or alternate-week plan has been started at the Lane Technical High School. By an arrangement with the Chicago Telephone Company, students to the number of forty or fifty are formed into two groups, one of which works for the company while the other group is in school. At the beginning of each week the groups change places, those at work returning to school, and those in school going to work. Students receive $9 a week while at work for the company. They receive no pay while in school. The students are selected from the fourth-year class on the basis of their knowledge of electricity because of the technical nature of the work they are called on to perform. Those who fall behind in their studies are not allowed to continue with the practical work. After graduation from the school the students are offered permanent positions with the company. Plans for extending the scheme to other lines of work are now under way.

[58] Taken from a circular issued by Cincinnati public-school authorities.

II. A Comparison with Other Cities

For purposes of comparison it will be profitable to take a bird's-eye view of present provisions for public industrial education in day schools in Chicago and in each of five other cities visited by the committee's representative. The outline here given shows in condensed form what is being done by each city as a whole.[59]

In Chicago

1. The Farragut Elementary Industrial School.
2. The Apprentice Schools.
3. Two-year and four-year vocational courses in high schools.
4. Industrial course in grades 6, 7 and 8 under consideration.

In Boston, Massachusetts

1. Optional industrial courses are provided in grades 6 to 8, inclusive, requiring five hours a week, but not jeopardizing the pupils' chances of being graduated in the usual time from the elementary school. Four schools offer such courses in woodwork and bookbinding. Similar courses in printing and in cobbling or elementary leather work are under consideration. One school has 140 pupils in these courses; another school has 75.

2. In two schools, 10 hours, or more, a week, are given in grades 6 to 8 for optional courses in woodwork and elementary metal. Students in these classes have little or no chance of being graduated in the usual time from the elementary school. About 40 students are enrolled in metal work.

3. A Boys' Vocational Class of 20 pupils from the upper grades of one public school building. This class is conducted by the North Bennett Street Industrial School (a social settlement school) in coöperation with the public school authorities.[60] A little less than half-time is given to woodwork, printing and drawing, and the remainder to related academic work. A two-year course in general vocational training is planned for this school, with the possible addition of a third year of more specialized and intensive trade training.

4. The establishment of a girls' vocational class similar to the boys' class is under consideration.

5. A pre-apprentice school giving a two-year course for boys who want to become printers' apprentices at sixteen years of age.

[59] Fuller descriptions of schools and courses in the five cities here included, and in other cities, are given in Chapters VI, VII, and VIII.

[60] The public-school authorities bear no part of the expense of the school.

One-half time to trade instruction and one-half to related academic work.

6. A pre-apprentice school in bookbinding is under consideration.

7. A "home school" for pupils in grades 4 to 8 of one school. A five-room apartment is being furnished completely by pupils in woodwork, brass and sewing classes, and is used for work in domestic science and homemaking. A garden is connected with the school. Pupils in grades 7 and 8 give 4 hours a week to this work.

Similar work in another elementary school is under consideration.

8. A girls' trade school, giving one-year practical trade courses in dressmaking, millinery, clothing-machine operating, and straw-machine operating, for girls between fourteen and eighteen years of age. About two-thirds of the time is given to trade instruction and one-third to supplementary academic work. Two hundred students. Subsidized by the State.

9. An independent industrial school admitting boys of fourteen years to four-year trade courses, under State subsidy, is being planned.

10. Girls' High School of Practical Arts. A four-year high school, distinctly technical in character, open to graduates of the elementary school. About one-half of the time is given to industrial work, and one-half to related academic work. College preparation is abandoned. Three hundred and sixty students.

11. The Mechanic Arts High School, which has thus far been the only high school in Boston offering a four-year course in manual training, is revising its course of study to the end that it shall prepare its pupils for industrial efficiency, and not for entrance to college or higher technical institutions.[61]

12. Afternoon industrial classes in two high schools offer work in jewelry and silversmithing and in elementary electrical manufacturing. Admission is limited to pupils regularly enrolled in the high school. About four hours a week are given to this work. Twenty-two students were enrolled in the class in jewelry and silversmithing, in May, 1910.

13. Day Continuation Schools[62] are provided which meet four or five hours a week for 10 consecutive weeks. Courses are offered

[61] Resolution passed by the School Committee, September 7, 1909.

[62] Although these schools are commercial, not industrial, in character, they are here included because of the importance of continuation schools in a complete system of vocational education.

in preparatory salesmanship, and in the dry goods and shoe and leather industries, for young men and women already employed in these industries. Students attend these classes during working time without loss of pay. Employers coöperate in meeting the expense of the schools and in furnishing experts in the industries to give the instruction. One hundred and seventy-four students. Courses for bank clerks and for persons in the wool industry are under consideration.

In Newton, Massachusetts

A good schematic presentation of the facilities afforded by the public schools of Newton, Massachusetts, to meet the needs of all classes of children is given by the outline taken from the Superintendent's report and presented herewith [p. 134].

Special attention is called to the articulation (shown by the arrows) of the Independent Industrial School with the grammar grades and with the Technical High School. The last four courses in the Technical High School do not offer preparation for college. All high-school courses are four years in length.

1. In the Extra Technical Course the usual four years' work in manual training for boys is completed in the first three years, about one-half of the school time being given to shop and drawing. In the fourth year specialized tradework is offered. Some part-time work in commercial shops may also be provided for in the fourth year.

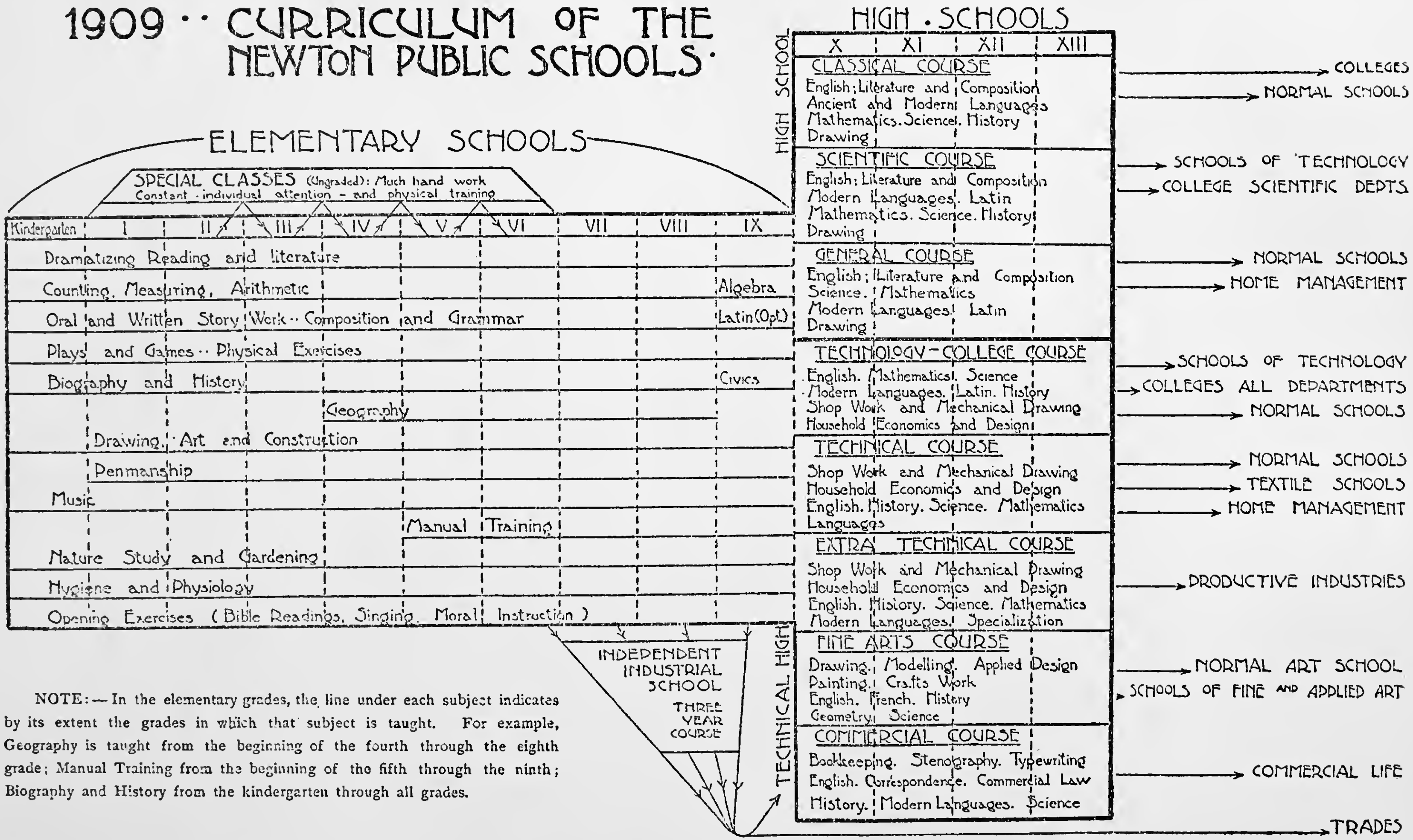
In the handwork for girls a similar distribution of time is made.

2. The Independent Industrial School admits boys who are at least fourteen years of age from the last four grades of the elementary school (there are nine grades in the elementary school). About two-thirds of the time is given to shop and drawing. Woodwork, machinework, electricity, printing and sheet-metal work are offered. The school is at present supported by a private citizen.[63] Forty-five pupils were enrolled in May, 1910.

In Cleveland, Ohio

1. An Elementary Industrial School is provided for pupils who are at least two years behind grade, and who have either finished the sixth grade or have tried and have failed to finish that grade.

[63] The school is administered by the public-school authorities, and it is not unlikely that it will ultimately be supported by public funds.



NOTE: — In the elementary grades, the line under each subject indicates by its extent the grades in which that subject is taught. For example, Geography is taught from the beginning of the fourth through the eighth grade; Manual Training from the beginning of the fifth through the ninth; Biography and History from the kindergarten through all grades.

Half-time is given to shopwork and half to closely related and practical bookwork. Boys have shopwork in wood and sheet metal. Girls have cooking, machine and hand sewing, and garment-making. Classes are segregated both in academic studies and in shopwork. The course is two years in length with a year or two for specialized work to be added if the need arises. One hundred and forty-five pupils.

2. A similar school for over-age pupils in a congested district was started in the autumn, 1910, in a new building with full equipment for manual training and household arts, and with a gymnasium and swimming pool.

3. The Technical High School offers a four-year course to graduates of the elementary school. Half-time is given to shop and drawing in the first three years, and two-thirds in the fourth. Preparation for college is not the dominating aim of the school. The academic subjects are not treated in the usual manner, but are organized about the needs of the school shops and laboratories and about the demands of industrial life. Classes are segregated throughout, the subject-matter for boys being different from that for girls. The school year is divided into four quarters of twelve weeks each.

4. The establishment of another Technical High School, similar to the present one, is under consideration, to meet the demand created by the present school.

In Cincinnati, Ohio

1. Day Continuation School for machine-shop apprentices. About 200 apprentices from 18 different machine shops give 4 hours a week, without loss of pay, to instruction provided by the Board of Education. The students are divided into nine groups, each group meeting one-half day a week for 48 weeks in the year. The course is 4 years long, corresponding to the regular apprenticeship term, and is closely related to the shop needs of the apprentices. No tool-work is given in school. One instructor spends two half-days a week visiting shops, on pay.

2. The Industrial Course for Boys is a four-year high-school course, giving five-eighths of the time the first two years to drawing and shopwork, completing in that time the usual four-year course in manual training. In the third and fourth years the students specialize in some trade as apprentices in commercial shops, under pay, spending alternate weeks in school and shop.

3. The Industrial Course for Girls is similar in organization to the industrial course for boys, offering in the first two years the usual four-year course in domestic science and art, and in the last two years the coöperative plan of one week in commercial shops or stores and the next week in school.

In the above industrial courses for high-school boys and girls the academic work is closely related to shop and industrial needs. The courses do not prepare for college. They are offered for the first time in 1910-11.

In New York, New York

1. The Vocational School for Boys offers a two-year preparatory trade course in machine shop, sheet metal, forging, plumbing, electric wiring, printing, carpentry, cabinetmaking, turning and patternmaking. One-fourth of the school-time is given to academic work closely related to the shopwork.

The school is open to graduates of the elementary school, and to those who are not graduates of the elementary school, provided the latter are fourteen years old and pass an examination on certain elementary subjects.

Sessions are from 9:00 A.M. to 5:00 P.M., 5 days a week, 11 months in the year. Three hundred students.

2. The establishment of another vocational school for boys, in a different part of the city, is under consideration.

3. A four-year industrial course for boys is offered in one high school, giving nearly one-half of the time to shopwork and drawing in the first three years, and in the last year seven-tenths of the time to advanced shopwork in a special line. Open to graduates of the elementary school.

4. A three-year technical course for girls is offered in one girls' high school, giving about two-thirds of the time in the last three years to courses for dressmakers and embroiderers, milliners, designers, printers, bookbinders and library assistants.

5. The Manhattan Trade School for Girls, formerly under private auspices, is now a part of the public school system. It offers trade courses in power-machine operating, dressmaking, millinery, novelty work and designing. About one-fifth of the school time is given to academic work closely related to tradework.

6. A plan is under consideration to open the elementary school woodshops afternoons from three to five o'clock, and evenings and

Saturdays, to boys over twelve years of age, and to others, for optional work.

7. Another plan is under consideration to establish optional industrial courses in one or two elementary schools where there are 60 or more classes in grades 7 and 8.

8. The Board of Education is attempting to secure from the State authorities permission to sell the products of industrial schools in the open market at prevailing prices.

Summary

The five cities compared with Chicago in the above outline were selected because they have made more complete provisions for industrial education than any of the other cities visited by the committee's representative. Boston leads all of the cities in this respect, with New York second.

All types of industrial courses thus far developed in public day schools in this country are represented in the six cities mentioned. The Apprentice Schools of Chicago are the only examples in this country of what may be called the "seasonal type" of day continuation schools. With respect to the organization of this type of continuation schools Chicago may be said to be in advance of other cities, since this type of school apparently fills a real need.

In the high school, Chicago has not provided — with the exception of the builders' course — as thoroughgoing industrial courses as Cleveland, Cincinnati and Boston. Chicago has no trade or preparatory trade schools and has very inadequate provisions for optional industrial courses in the upper elementary grades. Day continuation schools like those in Cincinnati are also lacking in Chicago.

In some of the cities a definite effort is made to articulate the industrial schools with higher schools. In Boston, for example, the industrial courses in grammar grades prepare students for any course in high school. In Newton, graduates of the preparatory trade school may enter any course in the technical high school.

III. Private Industrial Schools[64]

1. The Lewis Institute Coöperative Course for shop apprentices is a two-year course, distinctly technical in character, and intended to train apprentices in the machine trades for positions above that

[64] Schools and courses of college grade are not included.

of the actual mechanic. For admission, boys must be between sixteen and twenty-one years of age. No definite academic requirements are set for admission, but only 5 of the 36 boys in the course in November, 1910, had not completed the eighth grade, and nearly half had from one to four years of high-school training. The average age is about seventeen and one-half years.

Wages are paid weekly, for the time in school and the time in the factory shops, at the rate of 7 cents an hour the first year and 9 cents an hour the second year, all time lost from school or factory being deducted at the regular rate. The tuition fee of $50 a year is paid by a private benefactor.

The course was started in January, 1909, in coöperation with the Chicago branch of the National Metal Trades Association. About 21 firms were coöperating with the Institute in November, 1910. The apprentices are grouped in two's, each boy in a group alternating with his mate between school and shop in successive weeks. The two-year course counts as half of the four-year apprentice term.

The subjects studied in school are:

FIRST YEAR

Winter and Spring:	Hours per day
Principles of mechanics	2
Shop mathematics	1
English composition, literature and public speaking	1
Machine sketching	2
Foundry practice	2
Summer:	
Chemistry, demonstration lectures, laboratory work and recitations	6
Autumn:	
Principles of mechanics	2
Shop mathematics	1
English composition, literature and public speaking	1
Mechanical drawing	2
Patternmaking	2

SECOND YEAR

Winter, Spring and Autumn:	Hours per day
Engineering principles	2
Applied mathematics	1
English composition and industrial history	1
Machine drawing and design	2
Machine-shop practice and forgework	2
Summer:	
Electricity, engineering principles and practical mathematics	4
Laboratory work in testing machinery and strength of materials	2

The school sessions are 24 weeks a year, 5 days a week, 8 hours a day in the autumn, winter and spring terms, and 6 hours a day in the summer term. Half of the school time is devoted to drawing and work in the school shops, except in the summer term which is given over entirely to applied science and mathematics.

Comment. That the course is technical in character, as distinguished from the more narrow trade instruction, is evident from a glance at the subjects outlined above. The instruction in mathematics[65] is based largely on the work of students in the school shops and laboratories, and includes arithmetic, mensuration, and simple algebra and trigonometry. Some commercial arithmetic is introduced in connection with instruction in business forms, correspondence, etc.

Two hours a week are given to industrial history under the instructor in English. Lectures are given in the first hour, and the students write in the second hour on the subject of the lectures. An outline of the topics covered is given on page 222 of this report. The course treats of the general progress of industrial history mainly in England and the United States. It may not be amiss to suggest that a more intensive history of the machine trades, at least as a point of departure, would be more closely suited to the needs and interests of the apprentices, since they are at work in those trades.

One instructor, who acts as director or supervisor for the Coöperative Course, gives considerable time to interviews with factory managers, parents and pupils, in order to make proper arrangements for placing boys in factories for the week not in school. Little or no effort is, however, made to study the daily work of the

[65] See p. 216 for an outline of a course in applied mathematics worked out mainly in other classes of Lewis Institute.

apprentices in the factory with the object of relating the school instruction in a detailed way to that work. In this connection the coöperative courses in Beverly, Massachusetts, and Cincinnati, Ohio, offer suggestions which might be of value.[66]

An important feature of the course is the provision for shopwork in school in addition to that done in the factory. One weakness of coöperative courses is that the student may be subjected to more or less exploitation in the factory by foremen and superintendents, and that the factory training in certain highly specialized establishments may not be so broad as is desirable. Shopwork in school, together with some form of supervision by the school of the students' work in the factory, should be of service in overcoming this weakness of coöperative courses.

2. The day and evening classes of the Young Men's Christian Association, with a yearly enrolment of about 2,000 men and boys, are of interest for our present purpose mainly because they indicate a need for educational effort of the supplemental or continuation type which is at present not fully met by the public schools.

Among the technical courses offered to evening classes, the following are not covered by the public school evening classes: steam and gas engineering, engineering design, concrete construction and design, and heating, ventilating and plumbing.

A day school for apprentices in the building trades is conducted each year from January to March, inclusive, with an enrolment of about 50 students. The following subjects in the present tentative course of study indicate an effort to provide more practical instruction than that offered in the corresponding public Apprentice Schools before the year 1911.

Plan-reading, estimating and building construction. Short methods of taking off quantities, cost of material and labor, construction methods and strength of materials, with standard hand-books for texts.

Building law. Lectures on legal relations of achitect, contractor and owner; building ordinances, contracts, specifications, statements; lien law, estimates and tenders.

Mechanics of beams, logarithms, slide rule, study of the steel square.

The apprentice course is at present three years in length. Business English is offered in the first year only, and practical mathematics in the second and third years. Architectural drafting is

[66] See p. 207 and p. 201.

given each year. No instruction is offered in geography, history, civics or shopwork.

Tuition fees, in addition to the Association membership fees, are charged for all classes.

3. A correspondence course in printing is conducted by *The Inland Printer* under the direction of the International Typographical Union. The course aims to prepare compositors for positions in the more artistic phases of composition work. Thirty-seven lessons, in all, are provided: nine on lettering; ten on the principles of design and color harmony; ten on the application of these principles to various kinds of composition work; one each on layout of books, papermaking and platemaking, and four lessons on imposition. The distinctive feature of the instruction is the emphasis placed upon the principles of design and color harmony, developing by this means the initiative and independence of the student compositors.

The International Typographical Union pays all expenses incident to advertising the course and gives a rebate of $5 on the regular tuition fee of $25 to every student who completes the course satisfactorily. Many local unions offer their own members an additional part of the tuition fee.

About 1,500 students were enrolled in two years from the time the course was established (March, 1908).

4. Factory apprentice schools. Of the 181 firms from whom replies were received in connection with the investigation described in Chapter III, only three reported an apprenticeship system which included instruction in academic branches and drawing. These three schools are briefly described below. They are of interest for our present purpose mainly because they show the employers' attitude on the need for supplementary instruction of the continuation school type, and because they reveal to some extent the possibility of coöperation between the public schools and the industries.

Diligent inquiry failed to discover such a system in operation in any other manufacturing establishment in Chicago. A strong argument in favor of continuation schools in Chicago is thus furnished, on the one hand, by the small number of schools of this character in the factories of the city, and the fact that only the largest establishments can afford to provide them; and, on the other hand, by the testimony of employers and unions, given in Chapters III and IV, on the great need for a better trained class of skilled workmen.

(1) The Western Electric Company has a four-year course for machinist and patternmaking apprentices. Graduates of manual-training schools are given credit for the first year's work. Two hours a week are given to instruction in mathematics, mechanical drawing, and the reading of blue-prints and specifications.

(2) The McCormick Works, of the International Harvester Company, has a four-year course for machinist apprentices. Two hours a week are given to shop arithmetic. Between 50 and 60 apprentices were in attendance in February, 1910.

(3) The School for Apprentices of the Lakeside Press admits to the composing-room only those boys who are graduates of the grammar schools and who are between fourteen and fifteen years of age. For the pressroom, sixteen years is the minimum age requirement. Boys between fourteen and sixteen years of age work 4½ hours daily in the shops, and spend 3½ hours daily in the factory schoolroom. One-half of the time in the school is spent in trade instruction, under an instructor in printing; the other half is given to academic studies under a special instructor in these subjects. After the first two years, apprentices are required to spend the full time in the factory shops, and must take evening instruction, three nights a week, two hours each night, in a school provided by the company.

Instruction in the factory school includes a review of arithmetic (factory problems), English, drawing, physiography, simple book-keeping related to the printing-office, algebra, geometry, and the elements of mechanics applied to the machines, engines and motors in the factory equipment. In algebra, Wells' *Shorter Course* is used; in geometry, Wentworth's *First Steps in Geometry*. Some attention is given to the history of the alphabet and of printing.

The school was started in July, 1908. The length of the apprenticeship term is seven years. About 100 apprentices were in attendance in May, 1910.

5. The Coyne National Trade School is a short-course trade school conducted as a business undertaking for profit. Tuition fees range from $30 to $75. Courses are offered in plumbing, electricity, bricklaying, painting, decorating, paperhanging, and in architectural, mechanical, sheet-metal and carpenters' drawing. The courses in painting, decorating and paperhanging are under the direction of the Master Painters' Association, of Chicago. The catalogue states that 2½ to 3 months are ordinarily required to complete a course

in the day classes. No book instruction is given and no academic requirements are set for admission. The ages of students range from fourteen to fifty. The school was established in 1902. About 450 students were enrolled in 1909.

Comment. Schools of this type, run for profit, exist in many cities. Whatever may be said against them because of lack of thoroughness and because of the opposition they arouse among union men, it must be admitted that the large number of persons who are willing to pay the necessary tuition and living expenses indicates a need for instruction in the building trades not adequately met by present provisions in commercial practice. It is also evident that this need could be better met by public schools whose graduates should have a definite status as advanced apprentices.

6. The Chicago Technical College offers two-year courses in the day school in architecture and civil and mechanical engineering. No definite academic requirements are set for admission. No shopwork is offered. Tuition in the day school is $100 for the year of nine months; in the evening school, $65, three evenings a week. The total enrolment in 1909-10 was about 400. The school was established in 1903.

CHAPTER VI

INDUSTRIAL SCHOOLS AND COURSES IN OTHER CITIES

GENERAL IMPRESSIONS

This and the next two chapters present the results of a study of present provisions for industrial education in twenty-eight cities, twenty-four of which were visited by a representative of the committee. For this purpose, a total time of six weeks and one day was spent in travel, fifty-six different schools being visited.

While making this study some opinions were naturally formed by the visitor of the value of the various kinds of schools and courses provided and of the means and methods used in carrying on the work. These general impressions are presented below. Forty-three schools are described in Chapter VII, classified as to types. A statement is also given in Chapter VII of the present practice of seven cities in the matter of separate high-school buildings for manual training and technical courses. Chapter VIII contains a description of methods used in shopwork, some outlines of drawing and academic courses and text-books, and statistics on the wages of former students.

Some General Impressions

The large number and great variety of experiments now being conducted in this country with industrial schools and courses, many of them started within the last three or four years, brings one at once to the conclusion that it is no longer necessary to rely solely on the experience of European countries for examples of what we need in this country. Of the cities visited, Boston has thus far made the most complete provision for vocational training at all points in the school course.[1]

The importance of intermediate schools

By far the most significant of the schools now established are the prevocational or preparatory trade schools and courses for the

[1] For an outline statement of present provisions for public industrial education in day schools in six cities, viewing each city as a whole, see pp. 131-137.

years twelve to sixteen.[2] For, in the first place, in the trade school proper, intensive training for boys is commonly begun at sixteen years of age, or later, and this fact makes it difficult for the trade school to secure many students or to retain them long after they have entered. The experience of Milwaukee and St. Louis is evidence of this condition. Most of the boys to whom the trade school might appeal come not from the high school but from a class who have been at work and earning money during the two years or more since they left the elementary school. The feeling of independence developed in these years out of school is often such that the boy does not appreciate the future advantage of training in a trade school and is unwilling to make the present sacrifice necessary to secure that training.[3] In the case of the trade school for girls the same difficulty does not arise because the training is begun at fourteen, and the course is shorter.

The trade school is also handicapped somewhat by the great expense for equipment and for the high grade of instruction needed. Moreover, some trades are disappearing under modern conditions of factory production, and it is, therefore, a question to what extent school training in these trades is worth while. The field for the trade school proper is undoubtedly important, but it is not so large nor so immediately pressing as that for the more elementary industrial schools and courses.

In the second place, neither the trade school (for boys) nor the technical high school can be so effective as the more elementary industrial schools in meeting the most important phase of the problem of industrial education in the public schools — namely, how to remove the great waste now caused by the large numbers of children who leave school in grades 6 to 8, at fourteen years of age, to go to work, although the industries offer little by way of training or advancement before the age of sixteen, and little by way of financial compensation.[4]

The immediate problem of industrial education in the public schools is, then, mainly, though not entirely, a problem of intermediate schools with their beginnings in grades 6 to 8. Such schools are able to discover the different vocational interests and abilities of pupils, to lay a foundation of industrial intelligence, and to give

[2] See types 1, 2, 3, Chapter VII.
[3] See comments of employers, Chapter III.
[4] See Chapter II.

a measure of manual dexterity. Such schools and courses take the child before he starts to work and give him a training that will enable him to advance from unskilled or less skilled positions to positions requiring greater skill and greater industrial adaptability or intelligence.

It is just this adaptability, this power to advance, which is at present in greatest demand in the industries, because most of them do not furnish the necessary training themselves. It is this kind of training which will relieve the present industrial situation at the most painful point, in the crowded ranks of the unskilled and of those who now spend most or all of their lives at the monotonous and deadening task of merely tending a machine which performs only one of many processes entering into the making of a finished article of production. There is no objection to a boy beginning to work at an automatic machine; but there is serious objection if he is compelled to remain long at that process.

The strategic importance of schools and courses of this intermediate type can hardly be overemphasized. The high school has, of course, a distinct part to play — to provide technical training of a grade below that of the engineering college, for the increasing number of positions between that of the engineer on the one hand and that of the actual mechanic on the other. No doubt some of these positions will be filled by those who rise from the ranks with no more special school training than that obtained from the intermediate industrial schools referred to. It is also true that graduates of technical courses of a high-school grade must for the most part acquire the necessary practical experience by starting to work as actual mechanics. But it is the distinctive opportunity of the high school, and therefore its duty, to take advantage of the superior academic training of its students by preparing definitely for such intermediate positions. It should, of course, still be possible for the intermediate industrial school to articulate with the technical high school in such a way that students of the former may enter the latter school at appropriate points.[5]

In this connection attention should be called to the importance of having vocational advisers in the schools, to study the opportunities for work in the industries and the different interests and abilities of pupils, and to advise pupils and parents as to the best

[5] A good example of such an organization is given in the schools of Newton, Massachusetts, described on p. 133.

course of training to pursue, or the most suitable vocation to follow. Boston has one or more of such vocational advisers in each elementary and high school in the city.

There is still another type of industrial school not yet established in this country and only slightly developed in European countries, that seems to be greatly needed, namely, a day continuation school for persons at work in unskilled occupations. Commercial schools of this type are in operation in the Boston classes in preparatory salesmanship.[6] The Cincinnati Continuation School is for boys already apprenticed in a trade. In the unskilled occupations there is obviously a great need for day continuation schools giving instruction similar in character to that now offered in the prevocational or preparatory trade schools already referred to.

Factory apprentice schools

Three well organized apprentice schools in factories were visited — two conducted by the General Electric Company, at West Lynn, Massachusetts, and Schenectady, New York, and one conducted by the New York Central Railroad Company, at West Albany, New York. These schools are excellent examples of recent efforts of large establishments to provide an apprenticeship system to take the place of the old system, which is not suited to modern conditions of factory production.[7]

In the first place, very thorough provision is made in the three schools mentioned to give the apprentice an all-around shop training. In the two schools conducted by the General Electric Company this training is provided for about half of the term in a separate training room with full factory equipment and on the regular commercial products of the company. The shop training throughout the apprentice term is in charge of a supervisor who gives his whole time to the apprentice school. In the West Albany School the shop training is given in the regular shops of the company under the supervision of a shop instructor who gives his entire time to this work.

In the second place, instruction in drawing, mathematics and applied science is provided by these schools during working hours, and without loss of pay to the apprentices. This instruction is closely related to the shopwork. Especially interesting and sug-

[6] See p. 201.

[7] For a statement of the conditions responsible for the failure of the old-time apprenticeship system, see p. 55 ff.

gestive to public industrial schools are the courses in the West Albany School[8] in drawing and mathematics, which are organized entirely with reference to the needs of apprentices, and present the technic and the essential principles of these subjects, not in the abstract way of the conventional school course, but always by way of their applications to shop needs.

Undoubtedly, such apprentice schools as these have an advantage over the public trade school in that the instruction in the former is given under actual commercial conditions which the trade school can, in general, only approximate. Another very important advantage of the factory school is that it enables the boy to earn money while learning a trade. This is a very serious problem in connection with the public trade school, as already pointed out.

These factory schools, however, are essentially business undertakings, for officers state that even as a productive venture during the apprentice term they are not a loss to the company. It is probable that only the larger establishments can provide, without loss, such a thorough and comprehensive training. Unless, therefore, a much greater effort is made by manufacturers in general to provide a modern system of apprenticeship, it will still be necessary for this training to be provided, in part at least, by the public, either in a trade school or in some form of coöperative or continuation courses. Moreover, no matter how successful the factory apprentice school may be in giving intensive trade instruction beginning at the age of sixteen or later, it will still be necessary for the public to provide the proper training of a preparatory kind for the years fourteen to sixteen which are at present largely wasted, both to the industries and to the boys and girls.

Attitude of trade unions

Diligent inquiry was made in each city visited to ascertain from the school authorities the attitude of organized labor toward the industrial schools. In only one case was any opposition reported and that was in connection with a school supported largely by associations of employers. In many cases, union men serve on advisory committees for the industrial schools. In some cases, school authorities have submitted proposed curricula to the unions for criticism and suggestions. In Boston a representative of the State Federation of Labor made an investigation of the industrial schools, covering a

[8] For a brief description of these courses, see p. 218.

week's time, and returned a very favorable report. In general, it may be said that organized labor is not only not opposed to public industrial schools, but gives them its hearty approval and coöperation,[9] except where such schools are in danger of being controlled by employers.

Coöperative courses

Unions have gone on record[10] as being opposed to coöperative courses, on the ground that such courses put in the hands of employers too much power to do injury to the principles of unionism. It is true that coöperative courses do, unless properly safeguarded, put into the hands of employers power to control the instruction in various ways against the interests of pupils. But there is unquestionably a large field of usefulness for such courses, since they afford the boy an opportunity to earn money while continuing his education, and since they provide shop training under actual commercial conditions and the opportunity to relate the academic training closely and vitally to industrial needs. Surely such courses should be of advantage to employers and workmen alike. It is, therefore, to be hoped that experiments with coöperative courses will continue, that employers and workmen will soon see their usefulness, and that the public school authorities will see the importance of retaining sufficient control to direct these courses solely in the public interest, to secure the best possible training for the workers. As a matter of fact, no opposition on the part of unions is reported in cities where coöperative courses are established.

Coöperative courses now conducted in public schools may be classified into the following three types with respect to the time given to schoolwork:

> First, what may be called the "seasonal type," as exhibited in the Chicago Apprentice Schools.[11] These schools are for carpenter apprentices who are required by the apprenticeship indenture to attend school three months a year during the dull season — January, February and March. While attending school apprentices receive from the masters the full wage called for by the apprenticeship indenture. These schools were started in January, 1901, and are the only schools of this type in this country, so far as the writer knows.

[9] See p. 73 ff.
[10] Report of Committee on Industrial Education, American Federation of Labor, 1910.
[11] See p. 111 ff.

Second, the plan of giving alternate weeks to school and factory, as in Fitchburg and Beverly, Massachusetts. Apprenticeship indentures are made in the Fitchburg course but not in the Beverly course. In both cities pupils are paid only for the work in the factory.

Third, the day continuation type as found in the Cincinnati Continuation School. When this school was started, employers voluntarily agreed to coöperate with the school authorities by requiring their apprentices to attend the continuation school four hours a week without loss of pay. The Ohio State law, in effect in May, 1910, authorizes Boards of Education to require youths at work between fourteen and sixteen years of age to attend part-time day schools not more than eight hours a week.

A present, though perhaps not a necessary weakness of the coöperative plan should here be pointed out. When the shop training is left entirely under factory control it is open to the same objections that can be raised against the ordinary apprenticeship system — namely, that the shop training may be no broader than that offered by a particular establishment in which the work in some industries is highly specialized, and that the boy may be subjected to more or less exploitation by foremen or superintendents. The first objection may be overcome by offering shopwork in school. This is done in the Coöperative Course in Lewis Institute, Chicago, and is being planned in the Cleveland and Cincinnati high schools.

To overcome the second objection some form of supervision by school authorities of the shopwork in the factory is needed. In Beverly this is done by an instructor who spends the entire week in the factory with one group of boys, and the next week gives instruction to the same group in school in drawing, mathematics and science. All the boys work in one factory, in a training room set apart for this purpose. In the Cincinnati Continuation School one instructor spends at least two half-days a week visiting the eighteen factory shops. In Beverly, the shop instructor is paid by the employers for the time spent in the factory. In Cincinnati, the employers bear no part of the expense of the school.

An important feature of the supervision of the factory work is the opportunity it gives to bring the school instruction into close contact with industrial needs. In the Cincinnati Continuation School much of the schoolwork in drawing, mathematics and English is

based on the blue-prints and trade catalogues of machines used and products made in the factories. The following detailed statement of the method of coördinating school instruction with factory work, used in the coöperative course for engineers at the University of Cincinnati, will be of interest in this connection:[12]

Each class has a shop coördinator who is a college graduate acquainted with shop practice. He spends every morning at the university and every afternoon in the shops. His function is to make a direct weekly coördination of the work of the shop with the theory of the university. One afternoon, for example, he may be at the shops of a local manufacturing company, where he will observe the student apprentices at their work. He will know what they are turning out, their speeds, feeds and cuts, the angle of the tool, how the batch of work is ticketed, how the work is set up, the power drive — everything important in connection with the operation. The next week these young men will be grouped together with their classmates for two periods in class, when he will explain the functions of the particular articles on which the students were working, in the machine which the local manufacturing company builds. He will take up all questions of speed, feeds, cuts, accuracy, etc. The ticketing of the batch of work is gone into, and the system of shop routing is explained. Ultimately all problems of shop organization, shop accounting, cost keeping, shop planning, power transmission, heating, ventilating, lighting, etc., are discussed during the six years' course.

In conjunction with this a card system is employed, by means of which everything the student does in the shop that exemplifies a theory taught in the university is called in detail to the attention of the teacher of the theory, so that when the student comes to that particular theory the exemplifications which he has had in his practical work in the shop are called to his attention. It will be seen, then, that out of the student's own experience is drawn much of his course in mechanism, thermodynamics, machine design, strength of materials, shop economics, etc.

"Industrialized" shopwork

As shown in the detailed descriptions in Chapter VII of this report, many of the schools visited are introducing a kind of shopwork more practical than that of the usual manual-training course. This is done by making products for sale to individuals or firms, by making equipment, apparatus or furniture for school use, and by doing general repair work in and around school buildings. In some schools, students are paid for work done. An effort is also made in the more elementary courses to introduce shopwork on materials other than wood, such as bricklaying, concretework, plumbing, tinsmithing, sheet metal, bench and vise work, electricity, forge and foundry.

[12] Taken from an article by Professor Schneider in the *American Machinist,* September 9, 1909.

In the more elementary industrial schools and courses[13] this more practical shopwork has great significance because it suggests a kind of work which might well be substituted for some of the present work in manual-training courses, even when these courses are given for general educational purposes instead of for strictly vocational ends. Interesting experiments in this direction are being conducted in the elementary grades of Menomonie, Wisconsin, Fitchburg and Boston, Massachusetts. In Menomonie actual trade-work of a rudimentary character is substituted for the usual manual training in some classes in grades six to eight. In New York city a committee of the Board of Education proposed "to improve the efficiency of the present shop system in our elementary schools by reorganizing the manual training from a vocational point of view so that it may bear a direct and immediate relation to the industrial efficiency of the children when they leave school."[14]

Manual training is at present largely formal and abstract in the sense that the processes, while fundamentally industrial in their nature, are to a great extent taken out of their industrial or social setting and are given to the pupil as a series of exercises or problems which to him have little significance beyond the fact that they are school tasks; they are part of a course he takes. No doubt, present courses in manual training have disciplinary value, in that they give training in muscular coördination, in the power to think, and in other ways. The superior value of the industrial courses referred to above, indeed the feature that makes them truly industrial, lies in the fact that while they are concerned with processes much the same as those of the conventional manual-training course, they present these processes in their industrial or social setting; the boy sees and feels that his work has commercial value, for it is not only usable but actually used and needed. The significance of his work in the work of the world is thus revealed to him. There is, apparently, no reason why the present disciplinary value of manual training should be lessened, indeed it should be deepened, by the introduction of some of the industrial work referred to.

The main point here in mind is that the practical kind of shop-work offered in the more elementary industrial schools visited has a much greater educational value than the manual-training work usually offered. Especially is this the case when products are made

[13] Types 1, 2, 3, pp. 162-182.

[14] From the Minutes of a meeting held June 24, 1908.

in large quantities, as in the Rochester Factory School, in the industrial courses in Boston elementary schools, and in other schools. In these schools the division of labor introduced in making projects in large quantities makes it possible to develop a spirit of coöperation and a sense of social responsibility largely absent from the more individual work of the conventional manual training type. Time and cost cards and checking systems also aid in this development. Such work acquaints the pupil with modern methods of manufacture and factory organization, and gives the opportunity to develop leadership and organizing ability by the appointing of group foremen, and to develop inventive genius in the making of jigs or devices to facilitate manufacture. The necessary technic — the manual-training "exercises" — is all the more readily mastered as needed in the making of articles intended for real use, to fill a real need.

Nor is the frequent repetition of a single process necessarily deadening, if pupils are transferred from one process to another at suitable intervals. Indeed, a degree of efficiency and a feeling of mastery are thus developed which are far from deadening. The experience of schools with this kind of work shows that it is not necessary to introduce the motive of personal ownership to quicken the interest of pupils.

Related academic work and drawing[15]

With this more practical industrial work an excellent opportunity is presented to motivate the other school subjects, to make the shopwork and the industries in general the center from which drawing and the academic subjects radiate. Some schools are doing this very successfully; only one school was found — a trade school — in which such modified academic work was not considered appropriate and was, therefore, not attempted. An interesting example of this kind of correlation is given in the methods used in the Industrial School, at New Bedford, Massachusetts.[16] The course in drawing in the apprenticeship system of the New York Central Railroad would be a revelation to many teachers who think it necessary to postpone the applications of drawing until a series of "exercises" on the use of drawing instruments and on certain geometrical problems is completed. In the New York Central course the applications of drawing to shopwork are presented from the beginning, the technic being mastered as it is needed in the applied problems. In

[15] For some outlines of courses and text-books developed in schools visited, see pp. 215-231.

arithmetic, mensuration and mechanics, this vital relation to shop-work is also maintained.

What is greatly needed in the academic work of industrial schools is a number of text and reference books dealing with academic matter closely related to the industries represented in these schools. At present it is necessary for teachers themselves to organize this subject-matter while doing the regular work of instruction. A few mathematical books of the kind needed have already appeared.[15]

Courses in citizenship and in industrial history could be made especially valuable in vocational schools, for by means of these subjects some of the most pressing social problems of to-day could be presented in a very direct and vital way. The continuation schools of Munich, Germany, have excellent courses in these subjects, each very closely related to a particular trade.[17] In this country very little has yet been done in this direction. Most of the industrial history now offered treats only of the general development of industry — the Industrial Revolution, the Guilds, etc. This is, of course, worth while, but it is likely to be more or less remote and abstract to the tradeworker. It would be better to start with the history of the particular industry or industries represented in a given school or community and then generalize. A very interesting example of such a course is the one in the history of the boot and shoe industry, in the high school at Brockton, Massachusetts.[18] In only two other schools was such a course found — in the Cincinnati Continuation School, in which some instruction was given in the history of the iron and steel industry, and in the Pre-apprentice School, Boston, in which lectures are given on the history of printing.[19]

The academic subjects now being developed in vocational schools are of considerable significance also because of the suggestions they offer for the reorganization of the academic subjects in the regular elementary and secondary school curricula. There is much discussion at present of the importance of simplifying the course of study, especially in the elementary school, and of eliminating some things altogether. The vocational schools may well serve as experiment stations to point out the direction which this simplification and elimination should take. In the Cleveland Elementary Industrial

[16] See p. 214.

[17] See p. 119 ff. and p. 222 ff. See also *Organisation und Lehrpläne der Oblgatorischen Fach und Fortbildungs-Schulen für Knaben in München*, 1910.

[18] See p. 218 ff.

[19] See p. 221.

School a very conscious effort is made to work out a simplified course of study with this larger end in view.

It is frequently charged that the instruction in the elementary school is not suited to the abilities and interests of the pupils; that it is "fitted not to the slow child or to the average child, but to the unusually bright one."[20] Hence there are many over-age children in the grades, many who fail to be promoted and then lose interest and drop out of school. Many of these retarded children are present in the elementary industrial schools visited, and many teachers have testified to the remarkable progress made by these children under a kind of instruction which is suited to their interests and abilities. It is not too much to say that the regular elementary school has important lessons to learn from the work of these vocational schools.

Qualifications of teachers

Because of the newness of the industrial schools, teachers with proper qualifications for these schools are scarce — both in the shopwork and drawing and in the academic subjects. To a considerable extent, traditional standards and methods must be abandoned, especially in the academic subjects, and teachers must strike out boldly in the direction of industrial needs. Much of the conventional subject matter must be eliminated, partly for lack of time and partly because it is not suited to industrial needs. Much new matter must also be introduced. The different subjects of study must be unified as far as possible — mathematics must not be separated into water-tight compartments of arithmetic, algebra, geometry and trigonometry, but these branches must be interwoven into a single subject in close relation to its applications in science and in the work of the shop. All this requires a kind of ability and training not yet widely developed in teachers.

For the shopwork, teachers are needed who have had practical experience in commercial shops, and who also know how to teach. The combination is hard to get. It is especially difficult for men with years of practical experience in commercial work to adapt themselves to the work of teaching the younger pupils, unless they have much native ability in this direction. Of the shopwork observed by the writer, the poorest in technical finish was done by boys under the instruction of expert mechanics with years of expe-

[20] Ayres: *Laggards in Our Schools*, p. 5.

rience at the trade. Such instructors are too likely to be satisfied with a poor quality of work from the pupils on the ground that they are too young to do better. On the other hand, some of the best quality of shopwork observed was done by grammar-school boys under the instruction of women who could teach. Under present conditions, the right kind of a shop instructor, especially for younger pupils, can perhaps be most readily obtained by adding to the equipment of a trained teacher some practical experience in commercial shops. Some teachers are now preparing themselves in this way. The practical mechanic obtained from commercial shops is more likely to succeed with older pupils in advanced courses.

Separate buildings for industrial courses

There is much discussion as to whether industrial courses should be offered in separate buildings with a principal and teaching staff devoted exclusively to this work, or whether such courses should be given in the same buildings with general courses, and under the same principal and teaching staff. On the one hand it is urged that the separate building and teaching staff is necessary if vocational courses are to reach their full development. Many academic principals and teachers, it is claimed, are not yet in full sympathy with this work, and have not the qualifications necessary to give the vocational courses a distinctive aim. The industrial course should have the advantage of a distinctly industrial atmosphere and routine which can not readily be secured in the conventional school. On the other hand, it is argued that separate industrial schools would tend to produce a social stratification of pupils and parents which would work against the principles of a democratic society.

In most of the cities visited the more advanced industrial courses in public schools are in separate buildings. Optional courses in grammar schools are, with one exception, not in separate buildings. Of the preparatory trade schools all but one are in separate buildings. Trade courses proper are, with two exceptions, in separate buildings. In high schools, the tendency in large cities is, on the whole, to offer technical courses in separate buildings.[21]

There seems to be no good reason why industrial courses, at least the more elementary courses, should not ultimately be offered in the same buildings with other courses. Surely the conventional schoolwork could profit greatly by close association with industrial

[21] See p. 209 ff.

courses. Moreover, in small communities it might be financially unwise to establish separate buildings for this purpose.

Whether academic principals and teachers are in sympathy with industrial education is a matter to be determined in a given case; if they are not, it is more than likely that the experiment will not succeed in that instance. It is of the utmost importance that industrial courses should preserve their integrity, that they should be really industrial if they pretend to be. In the present experimental stage of this work the separate school, with a teaching staff concentrated upon and consecrated to the problem in hand, could be of great service in developing a content and method for industrial courses. In the larger cities such instruction could, no doubt, at first be offered both in regular buildings and in separate buildings. When industrial education is once thoroughly established, with a definite content and method, it should not be impossible to unite the various educational efforts into a single system so as to preserve a proper social balance.

Industrial education for girls

Four types of industrial education for girls were found in public schools, as follows:

(1) Home-making courses in elementary grades. Four hours a week in the Washington-Allston School, Boston [page 167]; ten hours a week in Fitchburg, Massachusetts [page 164].

(2) Preparatory trade schools for the years fourteen to sixteen, giving half of the school time to dressmaking, millinery and household science — the Albany Vocational School [page 173], the Cleveland Elementary Industrial School[22] [page 168], and the Vocational School at Yonkers, New York [page 177].

(3) Trade schools proper, beginning at fourteen years of age, giving most of the school time to intensive trade training, and comparatively little to homemaking and academic subjects — New York city [page 186], Boston [page 187], and Milwaukee [page 189]. Dressmaking and millinery are taught in all these schools. The New York and Boston schools offer in addition power machine operating on clothing and straw hats and (in New York only) novelty work and trade art. The courses are from a year to a year and a half in length.

[22] The Cleveland school is at present exclusively for over-age children. It is not yet giving all the work indicated, but will probably develop in that direction.

(4) Four-year courses in high school, giving from one-half to two-thirds of the school time to handwork, including applied art, with specialization in the latter part of the course in dressmaking, millinery and domestic science. In the Boston High School of Practical Arts specialization is permitted in the last three years, in Cleveland and Cincinnati in the last two years, and in Newton, Massachusetts, in the last year [see pages 193-196]. In Cleveland, Cincinnati and Newton, some form of coöperative work, alternating between school and industrial establishments, will probably be offered in the last year or two of the course.

With reference to the segregation of boys and girls the above schools may be classified as follows:

(1) In separate buildings exclusively for girls: the Boston High School of Practical Arts, and the trade schools in New York, Boston and Milwaukee.

(2) In the same buildings with boys, but classes segregated in academic subjects as well as in handwork: the Albany Vocational School, the Cleveland Elementary Industrial School, the Yonkers Vocational School, and the Cleveland, Cincinnati and Newton[23] Technical High Schools.

(3) In the same buildings with boys, and classes not segregated in academic subjects: the Washington-Allston School, Boston, and the Fitchburg Grammar School.

A strong tendency toward segregation is noticed in the above schools — in only two cases are the boys and girls in the same classes in academic subjects. In most cases the boys and girls are in the same buildings, but meet in separate classes for the academic subjects and for handwork. Such separation is, no doubt, called for by the fact that the subject matter in the classes for girls differs greatly from that in the classes for boys.

In general, it may be said that provisions for training in industrial occupations are not yet as fully developed for girls as for boys. There are many reasons for this. Some educators still have the more or less sentimental idea that training for girls should prepare only for homemaking, ignoring the fact that many must and do work for a number of years outside of the home. Training in home-

[23] Only the extra-technical course.

making must, nevertheless, be included in industrial education for girls, as well as training for a trade or other occupation, and this two-fold phase of the problem introduces complications.

The problem of deciding what trades should be taught to girls is a difficult one. At present dressmaking and millinery are the main trades taught in public industrial schools. The opportunities in industrial occupations are not as great for women as for men. Girls with the necessary academic training are more likely to enter commercial pursuits, which are in general more attractive in working conditions and in a financial way.

Nevertheless, many girls do enter the various factories, having left school at fourteen years of age in grades below the eighth. They start to work at unskilled or only slightly skilled occupations. The wages are low, little opportunity is presented in some lines for training leading to advanced positions, and yet the demand for skilled workers is in some cases great. The problem of industrial education for girls who leave school in the lower grades at fourteen years of age is just as important as the corresponding problem for boys. Girls as well as boys at this age need training which will develop the capacity for promotion. For the girls, trade training of either the preparatory or the intensive type may be begun at fourteen, while for the boys the intensive training is commonly postponed until sixteen.

The whole question of women in the industries needs thorough study to ascertain what the present conditions and opportunities are, and what the possibility is of improving these conditions and opportunities, and of opening new opportunities, by appropriate training. The New York and Boston trade schools have done excellent service in this direction. The experience of these schools shows that conditions may differ widely in different communities, not only in the kinds of industries present but also in the conditions prevailing in a given industry. To decide what trades should be taught in a trade school for girls it is, therefore, important to study the industries open to women in a given community to ascertain which employ large numbers of women; which industries require skilled workers; which offer the opportunity of a steady rise to better positions; which do not adequately provide the necessary training themselves; which pay good wages for reasonable hours of work; which are conducted under proper physical, sanitary and moral conditions; which provide work the year around, and, in the case of seasonal trades, what

opportunities exist for the worker to use the dull season in one trade for work in another trade. Moreover, this close study of the industries must be continued after the trade school is started, in order to adjust the instruction to the changing conditions in the industries due to the change in fashions and to the introduction of new machinery.

CHAPTER VII

INDUSTRIAL SCHOOLS AND COURSES IN OTHER CITIES (Continued)

DETAILED DESCRIPTIONS

Forty-three schools are described under I, below, classified as to types. All but four of the schools described were visited by the committee's representative. In the descriptions, matters of general organization, curriculum, entrance requirements, etc., are presented. To give an idea of the industrial character of the shopwork, lists of products are also included in cases where such lists were obtainable and were of general interest. Under II a statement is given of the present practice of seven cities in the matter of separate high-school buildings for manual training and technical courses.

I. Industrial Schools and Courses Classified as to Types[1]

The schools and courses described in this section may be classified into the following six types:

(1) Optional industrial courses for grades 6 to 8, inclusive, parallel to existing grammar-school courses, and not jeopardizing the pupil's chances of being graduated in the usual time.

(2) Industrial schools and courses for elementary school pupils twelve to fifteen years of age, which do not offer the possibility of graduation in the usual time.

(3) Preparatory trade schools for the years fourteen to sixteen.

(4) Trade schools proper, giving intensive training, beginning usually at the age of sixteen for boys and fourteen for girls.

(5) Technical and trade courses in high schools.

[1] The descriptions of the schools visited are based partly on observations recorded at the time of the visit, partly on statements made to the visitor by teachers and supervisory officers, and partly on printed statements in school announcements. An earnest effort was made to verify by means of personal observation, whenever possible, statements obtained from teachers and printed announcements, and to properly discount certain "overstatements" made by persons enthusiastically interested in industrial education.

The schools in this section which were not visited by the committee's representative are: The Vocational and Trade Schools, Yonkers, New York [p. 177]; The Trade School for Machinists, Saginaw, Michigan [p. 185]; the High School, Muskegon, Michigan [p. 199]; the Munich Continuation Schools [p. 204].

(6) Coöperative courses of the day continuation type[2] and of the alternate-week type.

The first three types might well be grouped as "intermediate industrial schools and courses," since they are intermediate in the sense of being preceded by the first five or six elementary grades, and of being followed by advanced courses in industrial or other schools.

The schools not specifically mentioned as private schools are conducted under public auspices.

1. Optional Industrial Courses in Grammar School not Interfering with Regular Graduation

1. In grades 6 to 8, inclusive, of the public schools of Menomonie, Wisconsin, trade instruction of a rudimentary character is offered to a few classes in place of the usual courses in manual training. This work is being conducted as an experiment by the Stout Institute, a training school for teachers of manual training and domestic science. The same amount of time per week is given to the industrial work as is given to the usual manual training in Menomonie. The regular academic work is carried along with the industrial work.

The object of this experiment is to determine the value which trade instruction in the grammar grades, as a substitute for manual training, has to offer for general training or cultural purposes and for vocational preparation for pupils who must leave school at the end of the elementary period. The work was given for the first time in the year 1909-10.

[2] No description is given of evening continuation courses for the reason that problems of organization and curriculum are much simpler for these schools than for the day continuation schools, and for the further reason that the demand for evening industrial courses is already well recognized in Chicago and excellent courses are in operation.

A good description of evening industrial courses offered by branches of the Young Men's Christian Association and by forty-seven other schools, public and private, may be found in Bulletin 11 of the National Society for the Promotion of Industrial Education.

Following is an outline of the industrial courses offered:

Grade	Courses offered	Number of weeks	Minutes per week
VI	Problems in practical carpentry	36	120
VII	Practical repair work	6	180
	Tin smithing	12	180
	Bricklaying and concrete-work	18	180
VIII	Plumbing	18	160
	Cabinetwork	18	160

The character of the courses is shown in a more detailed way by the following statement of the work:

GRADE VI

Carpentry

Three houses were built in miniature. The smallest, three feet by five feet, is a two-story braced frame, with no inside partitions. The middle house, six by eight, is a two-story balloon frame, with staircase and closet on the first floor. The largest, eight feet by fifteen feet, is a three-room bungalow, with full headroom, with a chimney and fireplace put up by the bricklaying class, and with plumbing fixtures for the kitchen and bath installed by the plumbing class. The large house is to be shingled and clapboarded, upper floors are to be laid, two of the rooms sheathed and one of them plastered.

GRADE VII

Repair work

Each boy has set a small window, repaired a broken chair or other piece of furniture, refinished a chair, fitted a key to a door or drawer lock, sometimes repairing small parts of the lock, sharpened an axe or knife or a pair of shears or skates, cemented a dish or glued a broken article, polished a piece of metal, and soldered a tin dish. Most boys brought articles from home for repair.

Tinsmithing

Bending square corner, laying out and cutting to line, riveting straight joint, soldering holes, soldering straight joint, making soldered square tin box, riveting and soldering cylindrical tube, cutting and bending curves, making funnel, making tin dust pan with handle, making box with cover, making and joining of two square tubes at a 45-degree angle.

GRADES VII AND VIII

Plumbing, bricklaying and concrete work

Boys in grammar grades, and some in the last two years of the high school, worked together in plumbing, bricklaying and concrete work.

Plumbing included a study of iron pipe and fittings, the running of soil pipe with vertical and horizontal joints and a series of soldering exercises. Complete installation of school kitchen and chemical laboratory fixtures, including the setting up of individual gas stoves, sinks with necessary connections, an instantaneous hot-water heater for the kitchen and several lead-lined sinks for the laboratory. A good deal of structural and rail work was done with iron piping.

Bricklaying and concrete work included a study of systems of bonding, the building of walls and arches of brick and concrete, the building of brick chimneys and fireplaces, laying of pavement for a sidewalk, and considerable work with cement.

All the brickwork and plumbing for a small annex to one of the school buildings was done by pupils in these classes.

2. In Fitchburg, Massachusetts, a differentiated curriculum for grades 7 and 8, with one-third of the time given to work in manual arts, household arts and commercial studies, is offered under the auspices of the Fitchburg State Normal School to pupils from any part of Fitchburg who have completed the sixth grade. Four courses, as outlined below, are offered, the completion of any one of which admits to the high school.

In the Manual Arts Course 10 hours a week are given to drawing, designing, making and repairing.

In the Household Arts Course 10 hours a week are given to work in domestic art and science.

In the Commercial Course 5 hours a week are given to bookkeeping, business forms and procedure, business arithmetic and related design, and 5 hours to typewriting and handwork.

In the Literary Course 5 hours a week are given to a modern language, and 5 hours to drawing, designing, making and repairing, for the boys, and household arts for the girls.

In all courses 12½ hours a week are given to English, mathematics, geography, history and science, and 7½ hours to physical training, music, general exercises and recesses.

The Literary Course is designed for those who expect to go on through high school and college. The other courses, while admitting to the high school, aim also to give a practical preparation for life-work to those who expect to leave school at fourteen years of age.

The school is in session 30 hours (60 minutes each) a week, and was opened for the first time in September, 1909, with 150 pupils. Two journeymen carpenters and one painter assist the regular manual-training instructors in directing the handwork of the boys. Ten cents an hour is paid to the boys for repair work done for the school outside of school hours.

A kitchen, dining-room and bedroom are provided for the work in homemaking. Following is a statement of handwork undertaken in the Manual Arts and Household Arts courses:

Ordinary repairs

Faucets in the buildings repacked. Schoolroom desks and tables scraped and refinished. Setting glass. Lawn mowers taken apart, cleaned, oiled and sharpened. Window screens painted. Decayed basement floors relaid. Broken furniture glued. Chairs reseated. Rubber pads on the stairs taken up, turned and retacked.

Woodworking

Work benches, looms and sawhorses constructed. Assisted in making kitchen tables. Making teachers' desks for entire building. Building partitions and 300 lockers.

Painting and finishing

Steam pipes bronzed to match color of the walls. Floors oiled. Chairs for building bought in the white, finished and seated by pupils. Kitchen, dining-room, woodworking room and locker rooms painted. Work benches and teachers' desks finished. Library room painted and papered.

Grading and walks

Work upon the grading, building of concrete walls and granolithic walks. Each boy has plotted the grounds and walks and taken levels under competent direction.

Household arts

The girls have made their needlebooks and workbags, their gymnasium suits and the bags to carry them in, also their caps and aprons for cooking. They have hemmed the towels for the kitchen, made covers for 18 typewriters, and for 170 bean bags to be used in games in the gymnasium. They have repaired the flags for the school building, darned the rug in the reception room, and are to make overalls and jumpers for the boys to use in painting. They have cleaned the windows in the kitchen, dining-room and sewing-room, cleaned all the basins in the new building, and have reseated chairs.

Applied art for girls

Stenciling of designs upon workbags and needlebooks. Designing covers for and binding books and magazines. Crocheting table mats for dining-room and knitting washcloths.

The practical character of the work in typewriting is shown by the following statement:

Typewriting

Copying of letters to industrial plants in various towns and cities of Massachusetts, asking for material for industrial exhibit. Original letters to school children in different parts of New England, telling of Fitchburg industries, and requesting replies concerning the industries of their cities. Copying letters to parents, explaining courses offered. Manifolding copies of poems and songs used in seventh and eighth grades. Copying bills for books, school supplies, and materials used at manual arts school. Practice in writing business letters and business forms. Typewriting language and spelling lessons.

3. In Boston, Massachusetts, optional industrial courses are provided in grades 6 to 8, inclusive, requiring five hours a week, but not interfering with the pupils' chances of being graduated in the usual time from the elementary school. The industrial work is substituted for the regular work in manual training, drawing and arithmetic. Four schools offer such courses in woodwork and bookbinding. One school has 140 pupils in these courses; another school has 75.

In the eighth grade of one of these schools, two of the five hours a week are given to free-hand and mechanical drawing, all bearing on the shop projects. In the free-hand drawing, illustrated catalogues of the shop projects were made, similar in character to catalogues of manufacturing firms.

Following is a list of objects made by one class in three years:

In Grade VI

850 pasteboard chalk boxes for the Supply Department
1,700 pasteboard crayon boxes for use in elementary schools
500 pasteboard pencil boxes, cloth-covered, for use in high schools
710 Harvard covers for use in high schools
846 wooden sand shovels for use in summer playgrounds

In Grade VII

34 portfolios for use in the Evening Industrial School
333 plasticine boards for modeling classes
266 wooden looms, 266 heddles, 522 shuttles — for the sixth-grade weaving of the elementary schools
100 wooden specimen boxes for use in the Normal School
36 workboxes
6 wooden cases for the Evening Industrial School (begun)

In Grade VIII

Completion of 6 cases above noted
100 plasticine boards for modeling classes
4 window ventilators
24 wooden trays for cardboard-construction equipment
100 wooden bench hooks for the Supply Department
1,000 wooden bench stops for the Supply Department
600 specimen blocks for the Agassiz School
2,400 card-catalogue boxes for the School Department (begun)

In one sixth-grade class of 75 boys and girls in bookbinding, 500 books from neighboring school libraries were rebound and 2,000 stenographers' notebooks were made, in nine months, each pupil working four hours a week.

4. In the Washington-Allston Elementary School, Boston, Massachusetts, the industrial work takes the form of providing a complete equipment for a model five-room apartment, full size, adjacent to the regular school building. There are 600 boys and girls in this school, in grades 4 to 8, inclusive. Four hours a week are given to industrial work in grades 7 and 8, and two hours a week in the other grades.

The five rooms include a living-room, dining-room, kitchen, bedroom and laundry. A garden is connected with the apartment building, and contains pear trees, cold frames and about fifty beds of various kinds of vegetables.

The equipment for the five rooms, made and installed by the pupils, includes wall coverings of burlap, draperies, shelving, built-in cabinets, and window seats; and about $250 worth of furniture, including tables, chairs (some upholstered), beds, bureaus, stands, desks and desk sets, hall clock, etc.

The boys pounded putty into the holes in the old floors, and rubbed them with sand, and stained and varnished all the woodwork. The boys also made 24 stepladders to be used by the public-school janitors.

The girls made caps and aprons, and the linen articles commonly used in dining-room, kitchen and bedroom. The girls also do the washing and ironing, sweeping, dusting, cooking and cleaning, and make jellies, preserves and soap.

The courses in design and English are intimately associated with the handwork of the pupils.

5. In New York city manual training centers in elementary schools were opened during the year 1909-10, after regular school hours, from three to five o'clock afternoons, and on Saturday mornings, especially for pupils twelve to fourteen years of age who cared to come, but also for others.

2. Grammar Schools and Optional Courses — Abandoning Regular Graduation

1. In Cleveland, Ohio, an elementary industrial school was opened in September, 1909, for boys and girls who are at least two years behind grade, and who have either completed the sixth grade or have failed to be promoted from the sixth grade. The average age of pupils is 14.2 years, and most of them are either foreign born or have foreign-born parents.

The school is in session six hours a day and gives about half of the time to English, arithmetic, and geography-history, and half to shopwork and drawing. All classes are segregated, and no attempt is made to give the same subject matter to girls that is given to boys. The course is two years in length with a year or two for specialized work to be added if the need arises. No attempt is made to provide regular graduation from the elementary school in the usual time.

The boys have shopwork in wood and sheet metal, mechanical and free-hand drawing, and design. The girls have cooking and household art, machine and hand sewing, garmentmaking, mechanical and free-hand drawing, and design. The practical work for girls includes plain cooking, serving of meals, infant feeding, invalid cookery and preparation of the tray, care of kitchen and dining-room, house sanitation, laundrywork, home nursing, household accounts, and visits to markets and house-furnishing shops. In sewing, it is planned to include order work from institutions and from individuals.

Especially interesting work is done in this school in simplifying the conventional academic subjects of the elementary curriculum

and in relating all that is offered very closely to the shopwork and to the industries. A detailed outline of the course in geography-history is given on pages 224-226 of this report.

The holding power of the school is shown by the fact that practically none of the pupils have left[3] although many have reached the legal limit of fourteen years.[4]

Comparison of the academic work done by the pupils in May, 1910, with that done in October, 1910, shows remarkable progress in these subjects. Teachers testify that the interest of the pupils in the modified schoolwork, and their confidence in themselves, are developing beyond their expectations.

2. In Boston a boys' vocational class of 20 pupils from the upper grades of one public school building is conducted by the North Bennett Street Industrial School (a social settlement school) in coöperation with the public school authorities. For admission to this class pupils must be at least thirteen years of age and must have reached the fifth grade.

A little less than half of the school time is given in the first year to woodwork, printing and drawing, and the remainder to closely related academic work.

A two-year course in general vocational training is planned, with the possible addition of a third year of more specialized and intensive trade training, with a six or even eight hour day. Work in metal is to be included in the shopwork for the second year.

The following outline of first-year work was given for the first time in 1909-10:

	Hours per Week
Shopwork — wood	6
printing	2
Mechanical and freehand drawing	2
Practical mathematics	3¾
English	2½
Spelling	1¼
Geography — history	2½
Reading — hygiene	2½
Recess and general exercises	2½
Total	25

[3] Up to May, 1910.

[4] Statement of the Superintendent of Schools.

3. In two public elementary schools of Boston 10 hours a week are given to optional industrial courses in wood and elementary metal work. Because of the amount of time per week given to the work, pupils in these classes have little or no chance of being graduated in the usual time from the elementary school.

Among the objects made by the class in woodworking are 140 blackboard rulers, metal handles being made by the class in metalworking, and 50 kindergarten chairs.

In the class in elementary metalwork three of the 10 hours per week are given to drawing. Following is a detailed statement of work done by the 40 pupils in this class:

Equipment of shop for benchwork in metal, making over old benches and installing simple tools, putting up shelves, etc.

General repairs in five school buildings in the district

200 cast-iron backs for high-school chairs, cleaned, drilled, fitted and painted

18 boards, some brass-bound, and 6 clamps, brass or iron bound, for bookbinding class

140 metal handles for blackboard rulers, the wood portion being made by the class in woodworking

75 card receivers for high-school laboratory

300 checks for toolroom use

200 drawing needles for sixth-grade rooms

90 desk wrenches

90 sets adjustable side desk castings

Simple templets made. Grinding tools for shop; also hatchets, knives and scissors for home use

3. Preparatory Trade Schools

1. The Factory School, Rochester, New York,[5] was the first industrial school in the State of New York to be conducted by local public school authorities under subsidy of the State. It was opened December 1, 1908, and offers a two-year course in preparatory trade training to boys who are at least fourteen years of age and who have finished the sixth grade.

The school is in session forty weeks in the year, 6 hours a day for five days in the week. Two-thirds of the school time is given to

[5] The statement of per capita cost, and list of products, and the description of equipment, are taken from a report furnished by the Director of Industrial Training.

shop and drawing, and one-third to academic subjects, as shown in the following:

	Hours per Week
Shopwork	15
Drawing	5
Shop mathematics	5
English	2½
Spelling and industrial history	2½

There were 104 boys in the school in May, 1910, 26 each in the departments of cabinetmaking, carpentry, electricity, and plumbing. There was also a waiting list of over a hundred boys. The faculty consists of a principal and six teachers.

The cost of the school from December 1, 1908, to January 1, 1910, including the summer session, and not counting the State aid, was $61.64 per capita. Reduced to the basis of a ten-months' session this gives a per capita cost of $56.39. In figuring this cost, the following items only are included: salaries, material, drawing supplies, repairs, and a sinking fund of ten per cent of the equipment. The sum of $2,939.64, representing the value of the products made and the repair work done by the pupils for the Board of Education, was subtracted from the total cost of the school, $9,104.02, in arriving at the above per capita cost.

Cabinetmaking Department

This department is a complete little factory, with its gluing room, machine room, assembly room and finishing room

The equipment of the various rooms is given below:

Machine room (cost, $1,700)

Cut-off saw, 2 universal saw tables, band saw, planer, jointer, horizontal borer, belt sander, grindstone, motors

Gluing room (cost, $250)

Glue heater, warming coil, glue rack, cabinetmakers' benches, clamps and hand screws

Assembly room (cost, $200)

Cabinetmakers' benches, equipment of special tools, low assembly tables

Finishing room (cost, $50)

2 cabinetmakers' benches
Low tables for lockfitting, etc.
Stain tables
Stain jars, brushes, etc.

In this department there is division of labor, the boys being promoted from one branch of the work to another as soon as a reasonable degree of efficiency has been acquired.

The following articles have been made:

200 bookcases	25 drawing tables
18 kindergarten tables	62 sawhorses
32 sand boxes	25 bench rests
25 drawing boards	15 miscellaneous articles
12 sewing boxes	200 looms
100 toy knitters	700 panels

Following is a list of articles now being manufactured:

25 large drawing boards	36 manual training benches
100 primary looms	12 umbrella racks
25 pillow looms, with heddles	50 bookcases, two designs, at $10
100 drawing kits	120 desk chairs
25 sawhorses	20 sanitary teachers' desks
50 sewing boxes	12 music cabinets

Any article to be included in the " line " of products must meet two conditions: (1) it must be something needed in the schools and which the Board of Education would otherwise purchase; (2) it must have educative value for the pupil. Many needed articles are rejected because the making of them would teach the boys little or nothing. The instructor of the department personally directs the work of the machine room and supervises the work of the other rooms largely through boy foremen.

Electrical Department

The electrical department aims to give to pupils a thorough course in sheet-metal work, in all branches of bell, telephone and light wiring, and the installation, operation and repair of A. C. and D. C. machines of all kind.

The equipment at present includes 20 benches, a telephone switchboard, D. C. and A. C. motors and generators. Cost, about $700.

Sixty-three jobs of electrical work were done in various school buildings of the city. Typical examples of this work were the replacing of a telephone, installing a buzzer, repairing gongs, installing lights, repairing fire alarms, installing spotlights, and repairing stereopticon.

Plumbing Department

The shopwork in plumbing includes tap and die work, joint wiping, the setting of all kinds of fixtures, gasfitting, and heating and ventilating. The cost of the equipment is about $300.

Carpentry Department

The carpentry course covers all branches of framing and interior finishing, including stair building.

The cost of the benches and tools for this department would not exceed $200.

Supplemental Construction and Repair Work

A most valuable supplement to the shopwork of the school is the constructional and repair work performed by the boys in the various school buildings of the city. Daily calls come to the Factory School from the grammar schools of the city for all manner of repair and installation work. In the afternoon groups of boys are sent out to measure up spaces, make sketches of work desired, or locate trouble if apparatus is out of order. The next day these boys make drawings of the work to be done and bills of material needed. A few days later, under an instructor or a boy foreman, they return to the school and complete the work.

The following are examples of repair work done:

In electrical work: repairing lights, telephones, fire gongs, motor; installing 5 horse-power motor and stereopticon lantern.

In plumbing: repairing closet tank, automatic tilting tank, broken water pipes, leak in flush pipe, sanitary drinking fountain, basin cocks; connecting gas plate, installing basin bowl, removing stoppage in basin waste.

In carpentry: building partitions in cellar, teachers' lockers, supply cupboards, porch, stormhouse; laying floors, moving of portable school building.

The holding power of the school is seen in the fact that of the boys in school in June, 1910, 67 per cent returned in the autumn, notwithstanding the fact that nearly all were entitled to a work permit.

2. The Vocational School for boys and girls, at Albany, New York, offers a four-year course, requiring 6 hours a day for 5 days in the week, one-half time being given to shop and drawing, and the remainder to closely related academic work. There were 100 pupils in the school, and 300 on the waiting list, in May, 1910. Most of the pupils enter from grades 6 and 7, and at the age of fourteen; some enter at thirteen years of age. The school was started in April, 1909.

Graduates of the school obtain credit in the apprenticeship system of the New York Central Railroad Company, at West Albany, New York, and in that of the General Electric Company, at Schenectady, New York.

In the home-making department a dining-room, bedroom, laundry, kitchen and living-room are provided. The girls prepare, serve, and manage the finances of the noon-day luncheon for the school, which is furnished to the students at cost. Pies, bread, etc., are also made by the girls and sold to private families. In the sewing work uniforms are made for the cooking class, overalls for the boys

of the shop, curtains and various linen articles for the dining-room, bedroom, etc., and a number of flags for the city schools.

In the woodwork some of the boys make articles to sell to friends and neighbors, being paid a certain rate per hour for the work. The following is a typical list of other objects made in the wood shops:

For the Board of Education:

100 bookcases	100 plant boxes
100 sand tables	50 wooden guns for military drill

For the student's own use:

Incubators	Screens
Brooders	Clothes boxes

The holding power of the school is seen in the fact that of the 44 students promoted from second-year work in June, 1910, 50 per cent returned for third-year work, regardless of the fact that no provision was made for their advanced training. These students petitioned the Board of Education for advanced training and were advised to enter the general high school or to repeat the second year's work in the vocational school. About half returned to the vocational school and only one of these had dropped out by January, 1911; some entered the high school temporarily.

Following is the curriculum for the four years:

Present Course of Study

Giving better elementary school provision for the vocational needs of those likely to enter industrial pursuits.

First Year

Corresponding to grade 7 of the elementary school

Boys:	Minutes per Week
Shopwork — joinery and elements of woodworking	600
Drawing — freehand and mechanical	300
Practical mathematics	225
English literature and composition	225
Geography	225
Opening exercises, music, physiology and study	225
	1,800

Girls:	Minutes per Week
Sewing — hand and machine, simple garmentmaking	225
Plain cooking and general housekeeping	450
Design	225
Practical mathematics	225
English literature and composition	225
Geography	225
Opening exercises, music, physiology and study	225
	1,800

Second Year

Corresponding to grade 8 of the elementary school

Boys:	Minutes per Week
Shopwork — cabinetmaking and wood turning	600
Drawing — freehand and mechanical	300
Practical mathematics	225
English literature and composition	225
History and civics	225
Opening exercises, music, hygiene and study	225
	1,800

Girls:	Minutes per Week
Sewing — hand and machine, garment making, embroidery, textiles	225
Cooking (plain, fancy, invalid), housekeeping	450
Design	225
Practical mathematics	225
English literature and composition	225
History and civics	225
Opening exercises, music, hygiene and study	225
	1,800

Proposed Course of Study

Allowing for special shop, laboratory and drawing-room practice along a chosen trade pursuit and thus making provision for the industrial interests which have been aroused in the two preceding years.

Third Year

Boys:	Minutes per Week
Special shop practice in patternmaking and foundry practice, or iron work, or electrical wiring and installation	600
Drawing — mechanical	300
Applied algebra and geometry	225
English literature and composition	225
Mechanics and electricity	225
Industrial history	150
Opening exercises and unassigned	75
	1,800

Girls:	Minutes per Week
Special work in millinery, or dressmaking, or domestic science	600
Design	300
Applied mathematics	225
English literature and composition	225
Practical physics relating to home	225
Industrial history	150
Opening exercises and unassigned	75
	1,800

Fourth Year

Boys:	Minutes per Week
Special shop practice in patternmaking and foundry practice, or ironwork, or electrical construction	600
Drawing — mechanical	300
Applied algebra and geometry	225
English literature and composition	225
Chemistry relating to industry	225
Economics and industrial conditions	150
Opening exercises and unassigned	75
	1,800

Girls:	Minutes per Week
Special work in millinery, or dressmaking, or domestic science	600
Design	300
Applied mathematics	225
English literature and composition	225
Chemistry relating to home and industry	225
Economics and industrial conditions	150
Opening exercises and unassigned	75
	1,800

3. A four-year course in vocational and trade training, similar in general organization to the course in the Albany Vocational School, is in operation in the Vocational and Trade Schools of Yonkers, New York.[6]

At this school vocational and trade courses in machine shop and forge rooms are given in addition to courses in printing, cement construction, pottery, shoe repairing and the usual woodworking courses, for the boys, and courses in dressmaking, millinery and homemaking for the girls.

The school has an endowment of nearly half a million dollars, but is an integral part of the public school system, and is subsidized by the State. The trade school was started in October, 1909, with 35 boys; the vocational school for girls, in January, 1910, with 34 pupils, and the vocational school for boys, in April, 1910, with 52 pupils. The equipment for the trade school alone cost about $15,000.

4. Other vocational schools for boys, under subsidy of the State of New York, and similar in a general way to those at Rochester, Albany and Yonkers, are located at Buffalo and New York city. The one in New York city, School No. 100, has a very complete equipment for machine, forge, plumbing and electrical work, as well as for the usual woodworking trades.

5. The Independent Industrial School, Newton, Massachusetts, offers a three-year course in woodwork, machinework, electricity, printing and sheet-metal work. For admission, pupils must be at least fourteen years of age, and must have reached the sixth grade (nine-year system). The average age at entrance is fifteen years.

[6] This school was not visited by the committee's representative. The description given was obtained by letter from the director.

The school is in session 6½ hours a day, 5 days a week, and 11 months in the year. About two-thirds of the time is given to shop and drawing. In the last year and a half of the course pupils are expected to specialize in some particular trade. Pupils may go from this school to certain technical courses in the high school.[7]

The school was started in the autumn, 1908, and is supported partly by State aid and partly by contributions from a private citizen. There are 45 pupils in the school, and three teachers. The per capita cost is about $100.

Nearly all the shopwork at present consists in the construction of such school equipment as it is possible for boys to make. Following is a statement of shopwork done from September, 1909, to June, 1910:

Work done for the Industrial School

4 sawhorses
11 drawing tables
20 boxes for electricity class
1 filing cabinet for office
12 desks and seats refinished
3 boxes for drawing-room
7 stools for electricity class
3 sandpaper boxes
18 ink-bottle stands
12 nail boxes
5 waste-baskets
40 feet of vise benches for machine shop
1 motor shelf and bracket
Erection of timbers, shafting, etc., in machine shop
1 blue-print frame
1 oilstone shelf
1 rack for bits
40 file handles
12 chisel handles
18 switch bases
18 bench rammers
18 rapping mallets
18 trowel handles
3 doz. sprues
Built toolroom cases, etc., in machine shop
Lumber racks in woodworking room, etc.
3 stands for electrical work
5 stands for printing equipment

Patterns made

1 gas-forge plate
1 gas forge
1 motor frame
1 planer jack
1 lathe attachment
1 pulley pattern
1 gas-engine valve
saw gauge, 4 patterns
1 shifter guide for band saw
3 surface plates
1 fly-wheel pattern
1 piston pattern

Work done for other schools

2 filing cabinets
1 sand table
1 modeling table
300 paper boxes
1 aquarium
180 boards for clay modeling
5 taborets for kindergarten
1 set of blocks for kindergarten

[7] For a complete outline of Newton school system, see p. 134.

6. A preparatory trades school in Columbus, Ohio, for boys who are at least fourteen years of age, and who have finished the sixth grade, was opened in November, 1909. About two-thirds of the time is given to drawing and shopwork in printing and the woodworking trades. Courses in machine and electrical work will probably be added soon. The products of the shops are largely for school use and equipment. There were 64 students in April, 1910. The per capita cost is about $100.

7. The Hebrew Technical Institute[8] for boys, New York city, is a private institution, established in 1884, and offers a three-year technical course, including shopwork in the usual woodworking lines, and in machinework, visework on metal, practical electricity and related academic subjects. About half of the time is given to shop and drawing the first and second years, and two-thirds in the third year.

For admission, pupils must be at least thirteen years of age and must have completed the 7B grade. The average age on admission is nearly fourteen years. Two hundred and eighty pupils were enrolled in 1909-10. The per capita cost is $115.

A very complete record has been kept of the occupations and weekly earnings of 634 graduates of this school.[9]

8. The Industrial School, at New Bedford, Massachusetts, offers a four-year course for boys, the first half of which is given to general vocational training, and the last half to specialized and intensive trade training. For admission, the minimum age is fourteen years, but no definite academic requirements are set. The average age on admission is 15½ years.

The school was started in September, 1909, and operates under subsidy of the State, which pays one-half of the expense of maintenance. Sessions are 6½ hours a day for 5 days in the week, and 3½ hours Saturday morning. Nearly two-thirds of the time the first two years is given to shop and drawing. There were 65 pupils in May, 1910. The per capita cost is about $150, not counting the State aid.

The work offered for the first two years is as follows. The

[8] This school is classified in this section largely because it corresponds in admission requirements more closely to the preparatory trade schools than to the technical schools described in a later section.

[9] See p. 236.

numbers indicate the number of periods per week given to each subject:

First Year

Mathematics	4
English	4
Shopwork, wood	10
Drawing	6
Physical science	6
Shopwork, metal	10

Second Year

Mathematics	4
English	4
Drawing	6
Shopwork, wood	10
Shopwork, metal	10
Industrial history	3
Civics and citizenship	3

All the academic work is very closely related to the shopwork. Boys work in both wood and metal shops from the beginning. Each year's work is intended to be a unit in itself, in the sense that nothing is taught in any one year solely for its value in a later part of the course.

The shopwork is taken up almost entirely with the making of the equipment needed by the school. The work in wood includes the use of the common bench tools, lathework, patternmaking, etc. The work in metal includes benchwork, the construction, operation and adjustment of the common machines, and the elements of forging. Some of the methods used in the shopwork and in relating the academic work to the shopwork are described on page 214 of this report.

9. The Vocational School, Springfield, Massachusetts, for boys who are at least fourteen years of age and who have finished the seventh grade (nine-year system) was started in September, 1909. A four-year course is offered, the first two years aiming at general vocational training, the last two at specialized and intensive trade training.

The school is in session 40 weeks in the year, 6 hours a day on 5 days of the week, and 4 hours Saturday morning. About two-thirds of the school time is given to shop and drawing. The school

is at present[10] using for its shopwork the equipment of the Springfield Technical High School. Fifty students were enrolled in May, 1910. The average age on entrance is fifteen years.

A one-story house for the use of high-school girls in the household arts course is to be built and furnished completely by students in the Vocational School and Technical High School.

10. The Pre-apprentice School of Printing and Bookbinding, Boston, offers at present a two-year course in printing to boys from grades 7 and 8 of one school, and a course in elementary bookbinding to boys and girls from the sixth grade of three schools. These classes are ultimately to be formed into an independent school in printing and bookbinding, open to pupils from all parts of the city.

In printing, the school sessions are 35 hours a week, about half of the time being given to instruction and practice in printing and related drawing, as shown by the following schedule of studies:

Mathematics (5 hours per week)

Fundamentals of arithmetic; industrial arithmetic; simple forms of bookkeeping and accounting

English (7 hours per week)

Compositions on business topics and current events; business correspondence; oral discussions

Industrial history (3 hours per week)

Growth and changes in industries; rise, growth and importance of printing; industrial progress; organizations of capital and labor; trades unions and their relations to industrial progress

Current events (1½ hours per week)

As related to progress in industrial, educational, social and political life

Spelling (1½ hours per week)

As used in business correspondence and in industrial and social life

Printing (15 hours per week)

Simplest kinds, suited to beginners, with such progress in subject matter and form as age and capabilities of students permit

Drawing (2 hours per week)

Form study and design especially adapted to printing and bookbinding

An outline of the instruction given in the history of printing is given on page 221 of this report.

[10] May, 1910.

Four hours a week are given to bookbinding. The work in binding in 1909-10 included the binding of 1,000 small notebooks, 100 teachers' manuals, and the rebinding of 500 dilapidated books from neighboring school libraries.

During the first year of the school, 1909-10, there were 26 students enrolled in printing, and 66 in bookbinding.

4. Trade Schools

A. Under Public Auspices

1. The School of Trades for Boys, Milwaukee, Wisconsin, offers intensive trade courses, two years in length, in carpentry and woodworking, machinework and toolmaking, and patternmaking, and a one-year course in plumbing and gasfitting. The school was originally conducted by an association of manufacturers, but was taken into the public-school system July 1, 1907, and is now supported by a special municipal tax, not exceeding one-half mill, in accordance with an act of the State legislature.

For admission, students must be at least sixteen years of age and must pass an examination in the elements of arithmetic and English, unless they are graduates of the eighth grade. Tuition is free to residents of Milwaukee between the ages of sixteen and twenty. Residents over twenty years of age pay $5 a month; nonresidents pay $15 a month. Students receiving free tuition pay $1 a month for material used. The average attendance in the day school in February, 1910, was 69 students. The per capita cost is over $300.

The school is in session 50 weeks in the year, 8 hours a day for 5 days in the week, and 4 hours Saturday morning. About three-fourths of the time is given to actual shop practice, and the remaining time to drawing, shop mathematics and some incidental English. The drawing and mathematics are closely adapted to the trade needs, each trade being provided with special material for study in these subjects.

The shop products have thus far been mainly used for equipment, but action was recently taken by the Board of Education authorizing the sale of products on the open market at current prices. All the carpenter work and plumbing required in the remodeling of a factory building purchased for the use of the school has been

done by students. The repairing, overhauling and reinstalling of the machine-shop equipment, partially destroyed by a recent fire, has also been done by students. For this work students were paid by the school at a rate per hour determined by their proficiency.

Because the School of Trades for Boys does not admit students under sixteen years of age, the school authorities are attempting to bridge the gap between fourteen and sixteen years by offering in the first two years of the high school industrial courses preparatory to the School of Trades. These courses include applied English, algebra, geometry, elementary science, business arithmetic, bookkeeping, and drawing, shopwork and visits to factories.

2. The Trade School at Worcester, Massachusetts, was started about February 1, 1910, with an equipment costing $30,000. The building, together with the lot on which it stands, cost $90,000. Four-year courses are offered in cabinetmaking and patternmaking and machinework. Plans are also under consideration to offer courses in bricklaying and other building trades.

The school year is divided into 4 terms of 12 weeks each, with a vacation of 4 weeks in August. New classes are formed each term. Eight hours a day are required, 5 days a week, and 4 hours Saturday morning for review work and to make up deficiencies. Students work in the school shops one week, and the following week in academic subjects and drawing.

The plan of spending one week in shopwork and the next in academic subjects and drawing enables the school to offer half-time classes in the academic subjects to boys at work who can arrange with their employers to absent themselves from work in alternate weeks. Three such pupils were enrolled in these classes in December, 1910.

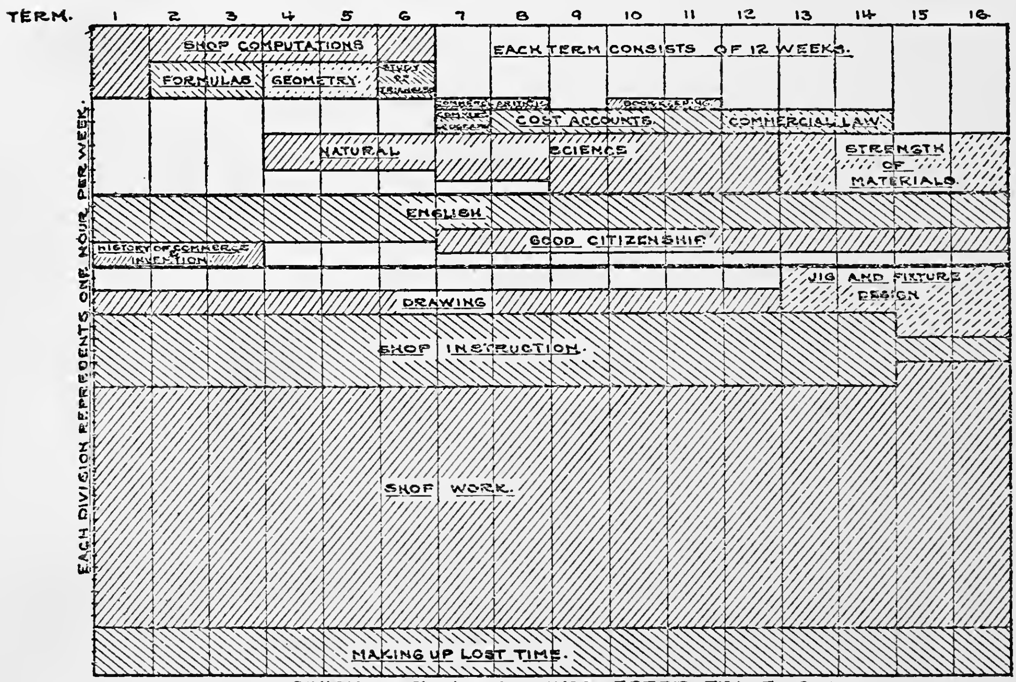
Day continuation classes are also offered to boys at work who can arrange with their employers to attend one-half day a week. Fifty-eight pupils were enrolled in day continuation classes in December, 1910. The subjects taught in these classes are shop mathematics, English, drawing and shop instruction. The latter subject includes the study of gearing, belting, tapers, cutting speeds, construction of machine tools, methods of doing machinework, etc.

The minimum age for admission is fourteen years. The average age on admission was sixteen years one month for the first class admitted, and fifteen years eight months for the second. One hundred and thirteen students were in attendance in December, 1910.

The building has a capacity for 300 students. Graduates of the grammar school are admitted without examination; others must submit to examination.

The school is supported by the municipality and by a State subsidy of one-half the cost of maintenance. Tuition is free to residents of Worcester; non-residents pay tuition as fixed by the State Board of Education. The per capita cost is estimated by the manager to be between $125 and $150.

All academic work is closely related to the shopwork and to industrial needs. The following figure[11] gives the complete curriculum for the 16 terms of the four-year course, showing the point at which each subject is begun, and the number of weeks and hours per week allotted to each subject.



DIVISION OF WORK. WORCESTER TRADE SCHOOL.

The value of shop products, made in the three months preceding May, 1910, was about $1,200. Of this sum, $700 represents the value of products made by 50 boys in about three months' time and actually sold. The value of the products sold is on the basis of $57 per boy for one year. The remaining $500 was the value of products made for school equipment. The total value of school equipment made by students up to December 1, 1910, was $1,634.50. The school hopes

[11] Taken from the Report of the Trustees, November 30, 1910.

later to be able to pay students for work done on products that are sold.

A typical list of products made and sold by the school is here appended.

100 drill bases planed
1,700 drill blanks turned
Cutting several hundred gears
300 bronze bushings
120 binder pulley shafts turned and ground
100 reverse clutches, bored and turned
50 to 75 lathe tool posts, complete
Several hundred grinder spindles, complete
25 sets change gears, 12-inch lathes, complete
12 11-inch engine lathes, complete
120 heavy forged screws

3. The Philadelphia Trades School, opened in 1906, is supported by public funds, and offers day courses, three years in length, in carpentry, patternmaking, printing, electrical construction, plumbing and architectural and mechanical drawing. About fifty per cent of the school time is given to shop and drawing. The academic instruction includes mensuration and algebra, plane and solid geometry, trigonometry, physics, chemistry, industrial history, English and American literature, rhetoric, economics and commercial law. Correlation of the academic instruction with shop and industrial needs is not made in the academic classroom, but is attempted in shop sessions when the need arises. The shop products are not sold.

The school is open to graduates of the grammar school, but others who are at least fifteen years of age may be admitted. The average membership in 1909-10 was about 220 in the day classes. The first graduating class, in June, 1909, numbered 24. Within one year from graduation these 24 pupils were earning an average of $9.50 per week.

4. A Trade School for Machinists, Saginaw, Michigan,[12] was opened in January, 1910, with 28 students over fifteen years of age. The school is administered by the public school authorities, but is supported in part by a private contribution of $2,000 for the first year's work. The present course of study is three years in length, about three-fifths of the time being given to shop and drawing. The school day is 5½ hours in length.

[12] This school was not visited by the committee's representative. The description given is based on a circular issued by the Superintendent of Schools.

5. The Manhattan Trade School for Girls, New York city, was conducted under private ownership from 1902 to September 12, 1910, when it was opened under the auspices of the public school system of New York city. While under private control it was supported by voluntary contributions. The description here given refers to its work under private control.

The school aims to prepare the youngest and poorest of women workers to be self-supporting in the shortest possible time. Girls are, therefore, admitted as soon as they can satisfy the requirements of the Child Labor Law of the State: namely, a minimum age of fourteen, and the completion of grade 5A of the public schools or its equivalent. Sixty-five per cent of the pupils came from grades below the eighth in the year 1908.

The trades taught[13] are dressmaking, millinery, power-machine operating on clothing and straw hats, novelty work and trade art. The novelty work includes the use of paste and glue in sample mounting, sample-book covers, labelling, tissue-paper novelties and decorations, the covering and lining of cases and boxes, jewelry and silverware casemaking, lamp and candle shade making. The work in trade art includes costume sketching, stamping and perforating. Drawing is closely related to all trade work. Students are urged to learn several lines of work so that during dull seasons in one trade other work may be open. Practically all of the shopwork is on actual commercial products which are sold to individuals and firms at market prices. The value of the products sold in the eighteen months from January 1, 1908, to January 1, 1909, was about $24,000.

The school is in session 48 weeks in the year, 5 days a week, 7 hours a day. About one-fifth of the time is given to academic instruction, including business arithmetic,[14] business English, industries and textiles, civics, ethics of trade, and cost of living. Fifteen minutes daily are given to vigorous physical exercises to furnish relaxation.

A six-weeks' course in simple cooking in connection with the noon luncheon is given to twenty girls at a time who work in groups of ten each.

One year is required in most cases for the completion of a trade course. A second year is offered for advanced work. Certificates

[13] Detailed outlines of department work are given in the September, 1909, issue of *Teachers' College Record*.

[14] A book of problems in arithmetic, developed at this school, is described on p. 217 of this report.

to those who have completed a course are given only after satisfactory evidence is presented of successful work for at least three months in commercial shops. In 1909, 89 certificates were given. Tuition is free and financial aid is given to needy students.

The budget for the year 1908-9 was $49,000, including salaries, supplies, printing and maintenance. In that year 943 girls were enrolled. In May, 1910, there were about 270 girls in attendance. In the power-machine department there are 55 plain electric machines and 30 special machines for hemstitching, embroidery, etc.

A Placement Secretary is employed by the school to secure positions for the girls, and to study conditions in the industries, so that the work of the school may be kept in touch with the needs of employers. In 1909, 90 girls were placed in positions in six months. The wages of former students in this school and in the Boston Trade School for Girls are shown in Fig. 7, page 233.

6. The Trade School for Girls, Boston, Massachusetts, was conducted under private auspices from 1904 to September 15, 1909, when it was taken into the public school system. While under private control it was supported by voluntary contributions. It is now supported by city taxation and by subsidy from the State, which pays one-half the cost of maintenance.

The school is much the same as the Manhattan Trade School in the general aim and character of the work. In the Boston school pupils are admitted between fourteen and eighteen years of age, but no definite academic requirements are set. The actual academic status, however, of entering students, has been higher for the Boston School than for the New York School, about 34 per cent of the students entering the former school in 1908-9 from grades below the eighth, as compared with 65 per cent for the New York school in 1908.

Trade courses about one year in length are given in dressmaking, millinery and power-machine operating on clothing and straw hats. A little over one-fourth of the school time is given to academic and other supplementary tradework shown below:

Supplementary work (required of each pupil)

1. Spelling

    Terms used in trade

2. Business forms

    Trade problems, bills, accounts, etc.

3. Business English

   Application for positions, ordering materials, letters to customers, descriptions of costumes, hats, etc.

4. Textiles

   Processes of manufacture; judging kinds and qualities of materials; learning uses, widths, process, etc.

5. Industrial conditions

   History of local industries, factory laws, hours of labor, ethics of business

6. Color study and design

   Principles applied in copying and planning hats, costumes and other garments; judging good and poor design and color combinations; selecting materials in color schemes, and making designs for simple costumes and for braiding and embroidery

7. Personal hygiene and gymnastics

   Care of nails, hair, teeth and skin
   Need of proper exercise, fresh air, food and clothing

8. Cooking

   Planning, preparing and serving the daily luncheon; care of lunch-room, kitchen, dishes, closets, towels, etc.

9. Weekly assembly

   Business talks by director or guests

The school is in session 7½ hours a day, 5 days in the week, 12 months in the year. New classes are formed six times a year. Tuition is free to residents; non-residents pay $8 a month.

A Vocational Assistant is employed by the school to secure positions for the graduates and to study needs and conditions in the industries. Eighty-five girls were placed in positions in the year 1909-10, and the demand was so great that 200 could have been placed if they had been available.

Practically all the shopwork is on commercial products sold to individuals. The value of the products sold from September 15, 1909, to February 1, 1910, amounted to $1,790.61.[15]. The per capita cost of the school is $126.13, on a twelve-months' basis and on an average membership of 226.[15] On a ten-months' basis the per capita cost is $105.11.[15]

[15] From the Annual Report of the Business Agent for the year ending January 31, 1910.

7. The Milwaukee Trade School for Girls gives a one and one-half-year course in dressmaking, and a one-year course in millinery to girls who are at least fourteen years of age and who are able to pass simple tests in English and arithmetic. In addition to the shop-work, instruction is given in cooking and housekeeping, English, shop mathematics, industrial history, art and design, and physical culture.

The tuition and financial support for this school are the same as those for the Trade School for Boys.[16] The school is in session practically all the year for 5 days a week, 7 hours a day. About two-thirds of the time is given to shopwork. Some products are sold in the open market at current prices.

The cooking and housekeeping center about the noon luncheon, which is prepared, served and managed by the students, and furnished to them at cost.

B. Under Private Auspices

1. The Hebrew Technical School for Girls, New York city, offers a Manual Course and a Commercial Course, each eighteen months in length. About one-half of the school time is given to academic studies.

For admission to the Commercial Course students must have been graduated from the public grammar schools. For admission to the Manual Course students must have completed grade 7B, but preference is given to graduates of the grammar schools. The average age on admission is 14¾ years.

The school is not so strictly limited to trade-school work as are the Manhattan and Boston Trade Schools for Girls. In the Manual Course instruction is given in dressmaking, millinery, hand and machine sewing, embroidery, designing and drawing. Instruction is also given in history, English grammar, English literature, physiology, cooking, laundry work, housekeeping, physical culture and music. At the end of eighteen months graduates of the Manual Course may enter the dressmaking workroom and devote their entire time to commercial work, for which they receive a salary from the school. About 90 per cent of the products of the school are sold to institutions and to private individuals.

The school is in session the entire year from 8:30 A.M. to 4:00 P.M. In 1909 the average membership was about 400 students, with

[16] See p. 182.

a waiting list of nearly 300. Two-thirds of the students were in the commercial course. The per capita cost for 1909 was about $125. The school is supported by voluntary contributions. The wages received by former students of this school are given on page 234 of this report.

2. The Williamson Free School of Mechanical Trades, located at Williamson School, Delaware county, Pennsylvania, offers courses, three years in length, in bricklaying, carpentry, stationary engineering, machinework and patternmaking.

The school was established in 1888 and has been very successful in turning out skilled mechanics. Ninety-five per cent of its 726 graduates receive at once from sixty to one hundred per cent of full journeymen's wages, nearly all receiving the latter in less than one year.[17]

For admission, students must be between sixteen and eighteen years of age and must pass examinations in academic subjects of grammar-school grade. The school secures a picked body of students because the candidates for admission largely exceed in number the capacity of the school. Tuition, boarding, clothing, etc., are entirely free. All students are indentured as apprentices for the full term of three years. The school year is eleven months in length.

About one-half of the school time is spent in actual shopwork the first two years. In the third year nearly all of the time is given to shopwork. The shop products are not sold. The bricklaying and carpenter work on several of the school buildings was done by the students.

Academic instruction is given in reading, writing, grammar, arithmetic, algebra, geometry, trigonometry, physical and political geography, United States history, English literature, physical science, physiology and hygiene, civil government, chemistry, elementary vocal music, theory of the steam engine, strength of materials, building construction, mechanical and free-hand drawing and estimating.

The average membership in 1909-10 was 235 students. The per capita cost, figured on the same basis as public school instruction, is about $125.

3. The School for Apprentices and Journeymen, a part of the Carnegie Technical Schools, Pittsburgh, Pennsylvania, offers courses,

[17] A further statement concerning the wages of graduates of this school is made in connection with Fig. 6, p. 232.

three years in length, in four machine trades, including patternmaking, forge, foundry and machinework, and in six building trades, including bricklaying, painting, plumbing, heating and ventilating, sheet metal and electric wiring. From forty to fifty per cent of the school time is given to actual shopwork.

Students are admitted to the above courses at a minimum age of sixteen years and with an intellectual preparation equivalent to a year or two of high-school work. An entrance age of seventeen to nineteen years is, however, stated as preferable to insure successful work in the school. The school year is 30 weeks, 5 days a week, 6 hours a day. Tuition for residents of Pittsburgh is $33 a year; others pay $43.

A normal course, and courses in mechanical drafting and stationary engineering, each three years in length, are also offered. The normal course aims to prepare teachers for manual training and trade schools.

The average membership in the above courses in the day school was 263 in March, 1910. The per capita cost is about $125. The school has graduated 90 students in the four years of its existence. The wages received by the graduates immediately after leaving school have ranged from $45 to $110 a month, the greater number receiving $65 to $70. The shop products are not sold; some are used for school equipment.

4. The National Trade Schools and Technical Institute (formerly Winona Technical Institute), Indianapolis, Indiana, offers two-year courses in printing, pharmacy-chemistry, molding and machinework, a one-year course in lithography, and shorter courses varying in length from three to nine months, in bricklaying, tilesetting and painting. The school of lithography has an excellent equipment valued at $23,000.

Practically no academic work is offered, except supplementary science instruction in the two-year courses. In molding, for example, shop lectures are given in the elementary laws of heat, combustion and gases; the physical and chemical qualities of molding sands; the mechanical and chemical properties of the different grades of pig iron and their mixtures; the methods of storing and checking patterns; estimates, prices and sources of materials.

In the machine shop, products are made for sale, and students are paid fifty per cent of the selling price for work done on such

products. All foundry products are sold, and students in this course are paid for shopwork at the rate of 8 cents an hour at the beginning of the course. The foundry department is entirely supported from the sale of its products. The brick and wood work and the electric wiring for six houses in Indianapolis have been done by students of the Institute.

In the machine shop the coöperative plan is in use, a few of the students spending alternate weeks in commercial shops and in the school shops.

The school is supported by contributions from manufacturers' and employers' associations, by voluntary subscriptions and by a tuition fee of $100 in all departments. The minimum age for admission is sixteen years. No definite academic requirements are set for admission. About 250 students were enrolled in February, 1910.

5. The School of Printing, North End Union, Boston, Massachusetts, shows a very interesting contribution to the solution of the problem of the status of the trade-school graduate. A student on entering the School of Printing is regularly indentured to a master printer, the school term of one year serving as one of the five years in the apprenticeship term. A tuition fee of $100 is charged for the year in school. At the beginning of the second year the apprentice enters his employer's workshop and receives $9 a week for the first half-year, and is regularly advanced in half-year stages to $16 a week for the last half of the fifth year.

Students are admitted to the school at a minimum age of sixteen years. The sessions are 48 hours a week for 50 weeks. The school is under the supervision of a committee of master printers. The instruction embraces book, job and advertising composition, and platen-presswork. Eight students were enrolled in 1909. The equipment, capable of accommodating 15 students, is valued at $2,700.

6. The short-course trade school is well exemplified by the Baron de Hirsh and New York Trade Schools, for boys, and the Manhattan[18] and Boston [19] Trade Schools, for girls. All of these schools aim to give in the shortest possible time an intensely practical training sufficient to enable graduates to take positions as

[18] See p. 186.
[19] See p. 187.

helpers or improvers and to advance rapidly to full journeyman status. A very small portion of the school time is given to academic work.

7. The Baron de Hirsch Trade School, New York city, offers courses, 5½ months in length, in carpentry, plumbing, electrical work, machinework, house and fresco painting and sign painting. The shop products are not sold.

The sessions are 8 hours a day, 5 days a week. Nearly ten per cent of the time is given to drawing, mensuration and shop arithmetic. Tuition is free. The age requirement for admission is sixteen years. The average age on admission is 17½ years. The per capita cost for 260 students graduated in one year was $132. The school is supported by the income from the Baron de Hirsch Fund.

8. The New York Trade School, New York city, offers day courses, four months in length, in plumbing, electrical work, fresco painting, sign painting, cornice and skylight work, sheet-metal pattern drafting, bricklaying, carpentry, steam and hot-water fitting. The shop products are not sold. No academic work is given. The school is supported by endowment and by tuition fees ranging from $25 to $45. The average attendance in day classes in 1909-10 was about 135.

5. Technical[20] and Trade Courses in High Schools

1. The Technical High School, Cleveland, Ohio, opened in October, 1908, gives one-half of the school time to shop and drawing in the first three years, and two-thirds in the fourth year. The shopwork for boys in the first two and one-third years includes general courses in turning, cabinetmaking, patternmaking, foundry, forge and machine work. In the last part of the third year, and throughout the fourth year, specialization in a particular trade will be permitted, perhaps on the coöperative plan of one week in commercial shops and the next week in school. A course in practical printing and bookbinding will be offered as a fourth-year elective. The shop products are not sold; some are used for equipment.

The handwork for girls includes applied art, dressmaking, millinery, laundry, cooking and catering, with specialization allowed in the third and fourth years.

[20] For a discussion of the distinction between technical and manual-training high schools, see the report on *The Place of Industries in Public Education*, by a Committee of the National Council of Education, July, 1910.

Preparation for college is not the dominating aim of the school. Four colleges, however, admit graduates to the college technical courses, on recommendation of the principal.

The academic subjects are not treated in the usual manner. The mathematics, for example, is taught more as a tool for use in the shops and in industry, than as an abstract science, and the various branches, arithmetic, algebra, geometry and trigonometry are interwoven into a single subject. The science courses are likewise treated as applied science. German is the only language offered, other than English. Outlines of the courses in physics and mathematics are given on pages 217, 228 of this report.

Since all subjects are treated largely with respect to their applications, and since the applications which are of interest and value to boys differ greatly from those which are of interest and value to girls, all classes in the school are segregated.

The school year is divided into four quarters of twelve weeks each, and new classes are formed each quarter.

All shop instructors have had more or less practical experience in commercial shops.

This school and the High School of Commerce, which was started in October, 1909, have been largely instrumental in bringing about an increase of 1,002, or 20 per cent, in the total high-school enrolment in Cleveland, whereas in the three years preceding the opening of the Technical High School, the enrolment in high schools had remained practically stationary.[21] In the Technical High School the enrolment in 1909-10 was 1,103.

2. The High School of Practical Arts for Girls, Boston, Massachusetts, is a part of the public school system, and gives a little over half the time to handwork, including applied art.[22] In the first year all students take the same work, which includes handwork in sewing, cooking and housewifery and applied art. In the last three years vocational courses are elected in dressmaking, millinery or household science.

[21] The figures as furnished by the Superintendent of Schools are shown in the following table:

High-school attendance, Cleveland, Ohio.

	1905-6	1906-7	1907-8	1908-9	1909-10
Total high-school enrolment	4,983	5,059	4,989	5,516	5,991
Total population of school age....	121,883	125,368	128,043	129,030	

[22] A description of the course in drawing is given on p. 218.

The academic work is the same for all students throughout the four years, and includes English, history, mathematics, science, French and German. The school does not prepare for college.

Science and mathematics are taught largely through their applications to the home and industrial needs of the girls. In history special attention is given to the development of art and industry.

The school was organized in September, 1907, and is open to graduates of the grammar school. Three hundred and sixty students were in attendance in May, 1910. The number of applications for admission to the school in 1909-10 was double the number that could be accommodated. The shop products are not sold. The per capita cost for the year ending January 31, 1910, was $85.66.[23] The corresponding per capita cost of all normal, Latin and high schools in the city was $78.81.[24] The school sessions are 5¼ hours a day, 5 days in the week, for the regular school year.

3. In Cincinnati, Ohio, a Boys' Industrial Course and a Girls' Industrial Course are given in each of two high schools, which offer also the usual academic and manual training courses.[25]

In the industrial courses the usual four years' work in manual training, for the boys, and in domestic science and arts, for the girls, is completed in the first two years. For this purpose about five-eighths of the school time the first two years is given to shop and drawing, for the boys, and to handwork, including applied art, for the girls. All classes are segregated. In the last two years the students specialize in some trade as apprentices in commercial shops or stores, under pay, spending alternate weeks in school and shop.

The courses are offered for the first time in 1910-11. The subjects of study and the distribution of time are shown in the following outline:

[23] Exclusive of repairs, rent, administration and supervision. Taken from the Annual Report of Business Agent.

[24] Annual Report of Business Agent.

[25] For the relation of the administration of the industrial courses to the regular high-school administration, see p. 210.

BOYS' INDUSTRIAL COURSE

First Year	Second Year	Third Year	Fourth Year
English .... 4 Arithmetic and algebra .... 4 Industrial geography .... 4 Drawing .... 4 Turning, pattern and cabinet making ....16 Physical training (optional) 2	English .... 4 Applied mathematics .... 4 Physics .... 4 Drawing .... 4 Foundry, forge and machine...16 Physical training (optional) 2	Chemistry ......10 English .... 2 Drawing ....10 Applied mathematics, shop problems and practice ....10 Coöperative plan: Alternate weeks in shop and school	History (industrial of U. S.) and civics .... 5 Shop science and shop practice...10 Drawing ....10 Applied mathematics and shop problems ......10 Coöperative plan: Alternate weeks in shop and school

GIRLS' INDUSTRIAL COURSE

First Year	Second Year	Third Year	Fourth Year
English .... 5 Arithmetic and algebra .... 5 Applied art...... 5 Cooking .... 4 Sewing .... 8 Physical training. 2 Music 1	English .... 4 Geometry and arithmetic ..... 4 Chemistry ...... 5 Applied art...... 2 Cooking and household arts.. 6 Millinery and dressmaking ... 8 Physical training. 2 Music 1	English .... 4 Physiology ...... 4 Applied art...... 5 Elect specialty...20 Millinery, etc. Dressmaking, tailoring and art needlework; home economics; office training; salesmanship	American history and civics..... 5 English .... 4 Applied art...... 5 Elect specialty...20

4. The Technical High School, Newton, Massachusetts, offers the following five courses:[26]

Technology-college Course, leading to colleges and schools of technology.

Technical Course
Extra Technical Course
Fine Arts Course
Commercial Course
} Not leading to college.

Students in the academic high school, located near the Technical High School, may take optional courses in manual training in the Technical High School.

[26] For the outline of the entire high-school curriculum, see p. 134.

In the Extra Technical Course for boys and girls the usual four years' work in manual training for boys, and in domestic science and art for girls, is completed in the first three years. For this purpose a little over one-half of the time is given to shop and drawing, for boys, and to handwork, including design, for girls. In the fourth year specialization in the shopwork is permitted. Individual pupils may arrange to do this specialized work in commercial shops on some kind of a part-time plan.

The Technical High School was opened for the first time in September, 1909, with 500 students enrolled. All shop teachers have had more or less experience in commercial shops. The shop products are not sold. About fifty per cent of the products the first year were used for school equipment, including T-squares, drawing-boards, suit-case toolboxes for individual students, drawer equipment, apparatus for physics laboratory, etc.

An outline of the subjects of study, and of the distribution of time, is herewith appended. The outline shows three applied academic subjects: in the third year, shop mathematics and mechanics; in the fourth year a course in arithmetic and accounts and a course in applied mechanics and steam.

EXTRA TECHNICAL COURSE

Purpose of the course: This course prepares for work in the productive industries.

FIRST YEAR

	Periods
English	4
Elementary science	5
History or arithmetic and algebra	4
Singing and physical training	2

Elect one group

	Periods
Cabinetmaking and wood turning	10
Mechanical drawing	4
Household economics	10
Design	4

Also elect one group

	Periods
Physics	5
Light machine and visework, ½ year; Forging, ½ year	10
Mechanical drawing	4
Biology and chemistry	5
Household economics	10
Design	4

SECOND YEAR

	Periods
English	4
Geometry or history	4

THIRD YEAR

	Periods
English	4
Commercial geography and history	5

THIRD YEAR

Elect one group

Shop math. and mechanics	5
Patternmaking and molding, ½ year; Machine-shop practice, ½ year	10
Mechanical drawing	4

Chemistry and physiology	5
Household economics	10
Design	4

FOURTH YEAR

English	4
American history and government	4
Arithmetic and accounts	2

Elect 18-20 *periods*

Algebra and geometry	4
Chemistry	6
Physics	6
Physiology and hygiene	4
Biology	5
Electricity	6
Applied mechanics and steam	4
Trigonometry	4
Stenography	5
Typewriting	5
Bookkeeping	5
Cabinetwork	6-10
Forgework	6-10
Toolmaking	6-10
Patternmaking	6-10
General machine-shop practice	6-10
Machine or architectural drawing	4-10
Dressmaking	6-10
Millinery	6-10
Dietetics	5
Foods	5
Laundering	5
Catering and lunch-room practice	6-10
Design	4-10

In place of a part of the elective requirements of this year, individual pupils may engage in approved work — of educative value — outside of school.

NOTE.— With the approval of the principal, a practical study of the elements of gardening and forestry may be substituted for a portion of the prescribed work of the first three years, and may be taken as a 6-10 period, elective in the fourth year.

5. The Technical High School, Springfield, Massachusetts,[27] offers a technical course for boys, and one for girls, in which about one-half of the school time is given to shop and drawing, throughout the four years, with specialization in a particular shop in the fourth

[27] The technical high schools at Newton and Springfield, Massachusetts, are good examples of high schools which provide college preparation in manual training and other courses, but endeavor also to give special technical courses for pupils who wish to enter the industries immediately after graduation. Such efforts are, of course, commendable. There is, however, considerable debate at present as to whether courses so organized can, under present conditions, meet the need for specialized technical training on the secondary level as fully as that need ought to be met; whether both the academic and the shop instruction can be adapted to industrial needs as closely and completely under such a plan as under a more isolated form of organization such as is shown by the Cleveland and Cincinnati high schools and the Boston High School of Practical Arts for Girls. It is largely a question of the extent to which college-entrance requirements and traditional academic standards may interfere with the complete development of the specialized technical course on its own merits, especially in its present experimental stage. It will therefore be interesting to watch the future development of the five schools mentioned, because they represent definite efforts to solve the problem in distinctly different ways.

year. A house for the use of girls in the domestic science and art courses is to be erected on the school premises. It is to be built, equipped and furnished completely by the boys and girls in the high school assisted by the boys in the Vocational School.[28]

6. Afternoon industrial classes, Boston, Massachusetts, are offered in two high schools: in one, a course in jewelry and silversmithing is offered; in the other, elementary electric manufacturing. The courses were started in September, 1909. Admission is limited to students regularly enrolled in the high school who have had a year or two of drawing and manual training. Each student pays for the material used, and will own the product of his work. About four hours a week are given to this work, and regular credit toward graduation is granted.

In the class in jewelry and silversmithing 22 students were enrolled in May, 1910. The work consists of (1) drawing a design of the object to be made, (2) modeling the object in plasticine, (3) making the finished object in metal. Some of the products made were jewelry-boxes, paper-knives, pad-corners, desk sets with ornamental designs, scarfpins out of silver wire, necklaces, silver rings set with inexpensive stones, copper charms, inkwells, fobs, etc. The cost of this course is less than that of the regular manual training course.

7. In the high school at Menomonie, Wisconsin, elective courses, each two years in length, are offered in the third and fourth years in machine-shop practice, machine drafting, architectural drafting, plumbing and bricklaying. Seven and one-half hours a week, for the regular school term, are given to this work. The regular manual training, including cabinetmaking, turning, patternmaking and foundry practice, is offered in the first and second years. In the year 1910-11 a house was to be built for a citizen of Menomonie by members of the sophomore class in the high school. All the carpenter work for this house, and the bricklaying, plumbing, decorating, fitting, etc., is to be done by the high-school students.

8. In the high school at Muskegon, Michigan,[29] a three-year elective course in printing is given in grades 9, 10 and 11, requiring 1½ hours a day for five days in the week. Thirty-five students were

[28] For a description of the Vocational School, see p. 180.

[29] This school was not visited by the committee's representative. The information was obtained from the Superintendent of Schools.

enrolled in February, 1910. The equipment, capable of accommodating 12 students at one time, is valued at $1,200. The students print school blanks, the school paper, physics exercises, etc.

6. Co-operative Schools and Courses

A. Day Continuation Schools[30]

1. The Day Continuation School, Cincinnati, Ohio, is supported entirely by the public school authorities and offers supplementary instruction to about 200 apprentices from 18 different machine shops who give four hours a week to this study, during working hours, without loss of pay. The students are divided into nine groups, each group meeting one-half day a week for 48 weeks. The course is four years long, corresponding to the regular apprenticeship term. No toolwork is given in school.

The course of study is as follows:

For first-year apprentices

- Shop arithmetic
- Geographic relations of shop materials
- Making and reading drawings
- Much reading, spelling, writing

For second-year apprentices

- Objective geometry
- Iron, its manufacture and founding
- Shop conventionalities and their necessity
- Composition on shop topics; lives of industrial leaders

For third-year apprentices

- Algebra
- Physics
- Foreman's question box
- History, literature and civics

For fourth-year apprentices

- Trigonometry
- Physics
- Shop practice
- Debating; man as wage-earner and voter

[30] Although the schools under 2 and 3 of this section are commercial, not industrial, in character, they are here included because of the light they may throw upon the general problem of the organization of day continuation schools.

The school was started in September, 1909. Two teachers are employed. One teacher is allowed two half-days a week to visit shops, consult with foremen, and gather practical shop problems. The manufacturers furnish blue-prints and catalogues of machines for the students to study. The cost of the school is about $2,000 a year.

The following quotation from the superintendent's report gives an idea of the value of the work.

> In most cases the output of the boys in the shops is greater than when they worked full time. Their attitude toward their employer, the foreman and the machine is wholly changed. In the school the boys show commendable progress and a remarkably earnest and serious spirit. The boy just entering this apprenticeship appreciates it least, but a few weeks of shop life change his attitude toward the school, as with the older boys a few weeks of the school change their attitude toward the shop. When the boys return to their shops they are quizzed by the workmen and foremen, and the lessons given in the school are quite generally discussed in the shops. Many of the workmen express a desire to have the advantages of such schooling.
>
> It is believed the number of manufacturing firms now coöperating will be doubled when the school is properly housed and a sufficient staff of teachers is appointed.
>
> An extension of the continuation-school idea is contemplated. There are at least 15,000 young people under twenty years of age now at work in commercial and industrial lines in this city who would be greatly benefited by having an opportunity to continue their schooling. The evening schools reach about 5,000. At least 10,000 need looking after.
>
> The Women Teachers' Club has a capable committee now at work to see what can be done for girls. It is hoped that by next September we may have the demand for a continuation school for young women in stores and factories.[31]

2. Day continuation classes in Boston, Massachusetts, are provided by the public school authorities for young men and women already at work whose employers permit them to attend the classes during working hours, without loss of pay. The courses offered, with the time schedules, are as follows:

Shoe and Leather — Tuesdays and Thursdays..........3 to 5 P.M.
Dry Goods — Mondays and Fridays..................3 to 5 P.M.

Preparatory Salesmanship:

Boys — Tuesdays and Thursdays.............8:30 to 11 A.M.
Girls — Wednesdays and Fridays.............8:30 to 11 A.M.

[31] A continuation school for saleswomen and one for children at work between fourteen and sixteen years of age were established in January, 1911.

Each course at present is ten weeks in length. The only expense assumed by the School Committee is the salary of the Director, and the rent, care and furnishing of the rooms. An advisory committee for each of the industries concerned assumes the responsibility of securing experts in the industry to give the instruction.

The courses were started in April, 1910. In the dry-goods and in the shoe and leather courses the instruction is given solely by employers and experts in the industry. In the courses in preparatory salesmanship the instruction is given by one of the public-school teachers, especially fitted for the work, supplemented by talks by heads of departments and experts in various dry-goods houses. It is planned to develop instructors from the present student body to take the place of the experts now giving the instruction. An outline of the courses of study is here given.

Shoe and Leather Course

The production and distribution of leather; tanning processes; leather manufacture; recognition of kinds, grades and comparative values of leathers; manufacture and classification of shoes; commercial arithmetic; commercial geography; commercial correspondence; salesmanship; efficiency training.

Dry-goods Course

Fibers; cotton and cotton goods; wool, worsteds and woolens; silk and silk fabrics; linen and linen fabrics; recognition and comparison of mixed fabrics; simple tests for determining quality; coloring materials and color preservation; shrinking; mercerization; non-inflammable fabrics; care of stock; commercial arithmetic; commercial geography; commercial correspondence; salesmanship; efficiency training.

Preparatory Salesmanship

Commercial correspondence; facility in oral and written expression; store arithmetic; sales-slip practice; sources of merchandise and its distribution; raw materials; textiles; penmanship; color and design; hygiene; practical talks on the fundamental principles of success; salesmanship.

The various lecturers bring large quantities of material to the classes for illustrating their talks. This material includes leathers, shoes and fabrics in all stages of manufacture. They also make considerable use of the blackboard. All these lectures are stenographically recorded and kept for future use. Reports are made to employers on the progress of the pupils.

Persons over eighteen years of age are not admitted to the class in preparatory salesmanship. The ages of the students in the other

classes range from fifteen or seventeen to twenty-eight or thirty. Each class is composed of from forty to fifty students. A few are college graduates, but the majority have not been graduated from the high school.

Additional courses are under consideration for bank clerks and for persons in the wool industry.

3. The School of Salesmanship for Girls, Boston, Massachusetts, is conducted by the Women's Educational and Industrial Union in coöperation with five department stores. Each store sends six students from its regular force to the school for the course, which is three months, daily except Monday, from 8:30 to 11:30 A.M. The full wage, $6 or more, is paid by the store to the student while she attends the school.

The purpose of the course is: (1) to teach right thinking toward the work as a profession and arouse a feeling of responsibility; (2) to develop a pleasing personality; (3) to instil a regard for system and cultivate a habit of attention to details; (4) to instruct in those subjects which increase knowledge of goods to be sold.

The subjects taught are:

Salesmanship, which includes discussion of store experience, demonstration of actual selling in class and lectures by representatives of the firms interested.

Hygiene, which includes study of daily menus, ventilation, bathing, sleep, exercise and recreation.

English, including spelling and business forms.

Arithmetic, which includes sales-slip practice, business arithmetic, business forms and cash account.

Stock, which includes a study of the nature of cloths, and processes of manufacture, color and design as applied to ribbons, display of goods in showcase, etc.

Practical talks by representatives of the firms interested, experienced salespeople, buyers, customers and superintendents, are given twice a week to the class on subjects such as "The Department Store's System and the Saleswoman's Place in It," "How to Show Goods," "Trifles," "Textiles," "Service to Customers," "Customer's Point of View."

The demonstration sales are conducted like the practice teaching in normal schools. Real customers, chosen because they represent different types, buy real articles. The sale is watched by the class,

notes being taken of strong and weak points. When the sale is finished, the one who has made the sale is allowed to criticize her own work, and then the class criticizes, the customer tells why she did or did not buy the article, and the whole is summed up by the Director.

As far as possible, the classwork is correlated; the drawing is a store plan or a design for a costume; the note-book work required gives material for English, including spelling, names and addresses, punctuation, penmanship and store English (and French); when the girls are sent to the stores for samples, salesmanship, color, designs, textiles are studied. The manner of the salesman in giving the sample is observed and reported, the color and design are used in the color lesson, and the material in the textile work. If the textile being studied is wool, one of the store lectures at that time will be on wool or woolen goods.

The school was started in 1906. An advisory committee representing the coöperating firms aids in determining the policy of the school. For admission, girls must be at least eighteen years of age and must have a good fundamental education. Ninety students were graduated in 1909.

The attitude of the coöperating stores toward the school training is shown by the fact that some superintendents already admit that three well-trained saleswomen can manage a counter better than six indifferent ones, and the well-trained, with good salaries, cost the store no more than the inefficient six.

4. The importance of providing day continuation schools for those at work in unskilled industries justifies the insertion at this place of the following statement of the organization and curriculum for such schools in Munich, Germany.[32]

District Continuation Schools

Fundamental Features

a. Attendance is for those who have spent eight years in a weekday school. This course comprises two years; the total compulsory school attendance is therefore ten years.

b. Attendance is required of all boys who are compelled to attend a Sunday vocational school, and who live or work in Munich, provided they

[32] Translated from *Organisation und Lehrpläne der Obligatorischen Fach-und Fortbildungsschulen für Knaben in München,* 1910. Outlines of the continuation schools for building-trade workers, in Munich, are given on p. 119 ff.

do not attend any other vocational school or are not for some good reason excused from compulsory attendance.

c. Instruction in the district continuation schools is given on weekdays.

d. Courses of instruction are given in the following subjects:

Courses	Hours of instruction	
	Class I	Class II
Religion	1	1
Composition and reading[1]	1	1
Arithmetic[1]	2	2
Life and citizenship	1	1
Gymnastics and gymnastic games, swimming	1	1
Manual training and drawing	2	2

Subject Matter

a. *Religion.* The instruction is prescribed by the church authorities.

b. *Composition, with reading.* Through the course in composition the pupil should acquire the ability to write the most important private and business letters and papers correctly as to grammar, syntax and orthography.

Class I. The private letter: Communication to members of the family, to relatives and friends concerning the life and experience of the pupil, also on school topics. Asking for and giving information, help wanted, applications for work; advertisements, price inquiries, ordering of goods and labor; different forms of letter writing.

Class II. Labor contracts, bills, receipts, complaints, excuses, testimonials, recommendations; compositions about debt relations, buying on credit, promissory notes, requests and demands for payment of bills, discounts; written communications to officials. Diary notes from the pupil's daily experiences. Various forms of bills of lading. The instruction in reading, together with that in life and citizenship, aims to aid the moral and general education of the pupils, and to instil in them pleasure and taste for good literature. For this reason the school library is to be used. From time to time a complete work of the German classical period is to be read. The selection of the reading is in the hands of the teachers.

c. *Arithmetic.* The instruction in arithmetic should give the pupil an understanding of how to conduct a household properly; it should awaken in him a desire for economy, and give him a suitable facility in industrial arithmetic.

Class I. Arithmetic necessary for the home and business of a trade worker: Earnings of a workingman by hours, days, weeks, months and years; the daily, weekly, monthly and yearly expenses of a single person and of a family; wage book, household-account book, balance for the month, for the year, savings accounts and interest, estimates for buying and selling, loss and gain, rebate, business expenses.

[1] The number of hours in composition and arithmetic is interchanged in alternate weeks.

Class II. Bills relating to taxes and insurance. Simple problems on surfaces and solids in connection with manual training. Drafts and checks. Simple bookkeeping for a business during one month.

d. *Life and citizenship.* This instruction aims to give the pupil an insight into a rational mode of living. Therefore it teaches hygiene, the problems of life in vocation, community and state, and above all it teaches those things out of which the pupil gains a knowledge of the necessary interrelations of the interests of all classes and vocations.

Class I. Relation of an apprentice to his work and master, apprenticeship indenture. Instruction in deportment: Conduct at home, in school, on the street, in society, toward superiors, employer and master. Hygiene: Structure of the human body in general; nutrition; injurious and nutritious food; respiration and blood circulation; care of the skin, mouth and teeth; dwelling and clothing; work and recreation; care of habits and the nerve system. First aid to the injured. The most important causes of disease; value of cleanliness.

Class II. History of handwork in general. The old guilds. Present status of the trades. The present trade unions. Division of labor. Working for wages. Importance and value of every kind of honorable labor to the individual, as well as to the community and nation. The community, problems of the community, social and economic institutions, rights and duties of a citizen of the community, positions of honor and trust. The state, problems of the confederation of states, the Bavarian government, duties and rights of a citizen of the state, positions of honor and trust. The German empire, foundation and constitution, problems of the empire, social laws, trade and commerce in modern times, German colonies, value of consuls in foreign lands.

e. *Gymnastics, games and swimming.* Gymnastics, with games and swimming, aims to rectify the one-sided muscle development, which is often acquired by unskilled labor, and developed into awkwardness and clumsiness. Agility and skill is developed, and a sense for order and relationship to the whole fostered. It shall awaken healthy ambition, exercise the will and self-discipline.

Classes I and II. In the winter semester will be given exercises on apparatus, such as wands, dumbbells, ladders, horizontal and parallel bars, as well as weight lifting. The work is to be given on a gradually advancing scale. During the winter semester athletic games are emphasized, as baseball, etc. After a course of dry swimming, which is given in the gymnasium, methodical instruction is given at the different bathing places of the city.

f. *Manual training, with drawing.* Instruction in manual training develops appreciation of manual work and the joy in craftsmanship, and brings, as far as possible, unskilled laborers or those without any occupation into the class of skilled labor. Above all, it aims at exactness in the work, helps the pupil to understand the raw materials most frequently used in industry, as wood and iron, and the use of tools. Instruction in drawing is closely connected with manual training. For those pupils who have not had

instruction in drawing before entering the continuation school, a short introductory course is provided which familiarizes the pupil with the use of ruler, angle and drawing instruments. The subject matter includes straight-line plane figures and ornamental figures with circular forms. Working drawings of shop products are also made. Sometimes scale drawings are undertaken. The shop projects are sometimes made from blue-prints. Those pupils who have had manual training in the last year of the grade school are given training in both wood and iron, and therefore change workshops after the first year. All other pupils are taught in only one line for two years, parents making the selection.

Woodwork: Class I. Raw material in its essential characteristics. Tools for clamping, measuring and working. Processes of sawing, planing, drilling, chiseling, etc.; making of exercises and simple, useful articles. *Class II.* The most important European and foreign kinds of wood; defects and diseases of wood; wood as an article of commerce. The common wood joints. Table and chair joints. Simple, useful articles.

Metalwork: Class I. Raw materials, production, the most important characteristics. Tools for clamping, measuring and working. Processes of marking, cutting, filing, planing, thread-cutting, bending, drilling, etc. Making of exercises and simple, useful articles. *Class II.* Further consideration of raw materials. Processes: More advanced work than in *Class I,* then thread-cutting, cold bending, riveting, grooving, soldering, etc. Simple, useful articles.

B. Alternate-week Courses

1. The Beverly Industrial School, Beverly, Massachusetts, offers, in coöperation with the United Shoe Machinery Company, a course of instruction in the machinist trade. The students spend alternate weeks in school and factory. The school-day is 8 hours, with Saturday holiday, and no home lessons. Factory hours and discipline are the same as for regular employees.

Fifty students are enrolled and are divided into two groups. The machinist-instructor for each group teaches that group in the factory one week, and the next week teaches the drawing, mathematics and science to the same group in school. Regular high-school teachers also give instruction in English, civics, industrial economics, business forms and practices, etc.

In the factory the student works on the regular factory products — shoe machinery — the raw material being furnished by the factory. The product of the student's work is inspected by regular factory inspectors and is put into the company's stock. One-half the regular piece-price for all his product that passes inspection is paid to each student by the factory; the other half is devoted to the maintenance of the shop.

The factory furnishes the shop equipment and pays the salary of the shop instructor while he is in the shop. In case a profit should accrue to the factory from the sale of products made by students, over and above the cost of maintaining the factory shop, such excess profit is to be devoted to the support of the school.

The school was started in August, 1909. For admission, pupils must be at least fourteen years of age and must have completed the sixth grade. The minimum age for admission will probably soon be raised to sixteen years because of the immaturity of the boys of fourteen and fifteen. No apprenticeship agreement or indenture is made. The school is under subsidy of the State, which pays one-half the annual cost to the city.

2. The coöperative course at Fitchburg, Massachusetts, is a four-year high-school course, the last three years being arranged so that each pupil spends alternate weeks in factory and school. The first year of the course is spent entirely in school. For admission, students must be graduates of the grammar school.

Seven firms, manufacturers of machinery, originally entered into the plan, requiring regular three-year apprenticeship indentures to be made with the students, by which they are to receive for the shop-work 10 cents an hour the first year, 11 cents the second, and 12½ cents the third year. Later the school authorities threw the industrial course open to all who could satisfy the entrance requirements, no matter at what kind of work they were engaged the week out of school. Most of the boys are paired in such a way that when one of the pair is at school the other takes his place at the factory. But in some cases employers are willing to get along without a substitute for the week spent by the boy in school.

All the boys work in the summer. The school year is 20 weeks in length. Twenty students are enrolled in the first year of the course, 20 in the second, and 20 in the third. The instructor in charge of the course spends from 5 to 7 hours a week visiting the students in the factories. Two of the students are sons of union men.

The schoolwork is applied as closely as possible to industrial needs. It includes English, current events and industrial history, arithmetic, simple algebra, geometry and trigonometry, mechanism of machines, physics and chemistry, commercial geography, civics and American history, business methods, drawing. In science and mathematics applications are taught rather than theory.

II. Separate High Schools for Technical and Manual Training Courses

In the matter of separate buildings for technical and manual training courses in high school, present practice shows many variations. In the seven cities mentioned below there seems to be on the whole a tendency to make a distinction between manual training courses and technical courses, and to offer the former in all high schools, but to give the latter in separate schools only. This tendency seems to be based on the view that technical courses, since they aim definitely at vocational training and require for the shop-work a larger portion of the school time than manual training courses, should receive the benefit of a school atmosphere given over largely and definitely to vocational training, and that such an atmosphere can be best developed in a separate technical school. Manual training, on the other hand, since it aims at the general education of the individual through the hand, regardless of his vocational future, should be given in all schools.

1. In St. Louis manual training is offered in all high schools. No distinctly technical courses are offered.

2. In Chicago a four-year course in manual or technical training is given in each of three high schools. In each of the remaining high schools it is planned to offer two years of manual training, although this plan has not yet been completely carried out. Two-year vocational courses are offered in all high schools for the first time in 1910-11.

3. In Cleveland all manual training of high-school grade is being concentrated in one or two buildings, where it is being intensified, one-half to two-thirds of the school time being allotted to shop and drawing. The manual training formerly given in other high schools is being discontinued, on the ground that sufficient time can not be given to it in academic high schools to produce satisfactory results.[33]

4. In Boston only one high school offers four years of manual training, and this school is shortly to be transformed into a distinctly technical high school for boys, offering preparation for industrial pursuits but no preparation for college or higher technical institutions. Two high schools offer afternoon industrial courses. Five

[33] Report of the Educational Commission, 1906.

outlying high schools offer not more than two years of manual training. Six academic high schools centrally located offer no manual training. The High School of Practical Arts for Girls is a distinctly technical school, in a separate building, and offers no preparation for college. The experience of Boston shows, according to a statement of the superintendent, that courses in domestic science and in household arts do not attract nearly so many students when given in the regular academic high school as when given in a separate high school as at present.

5. In Newton, Massachusetts, there are two high schools, one a technical high school for boys and girls, the other an academic high school without manual training equipment, and located near the technical high school. Students in the academic high school may go to the technical high school for optional courses in manual training.

6. In New York city (all boroughs) all but three of the nineteen high schools offer the general high-school course, four years in duration, with electives in commercial subjects in the third and fourth years. Of the three high schools not offering the general course, two are exclusively commercial high schools, for boys only, and one is devoted solely to manual training for boys. In the latter school a four-year industrial course is offered, in which a large part of the time is given to shopwork. Five high schools offer only the general course. Eleven high schools offer, in addition to the general course, a three-year commercial course, a three-year technical course for girls, or a four-year manual training course for boys.

7. Cincinnati affords a very interesting organization of technical, manual training and academic courses all in the same high-school building. There are three high schools in the city. Two of these offer for the first time in 1910-11 eight courses of study divided into two groups:

(1) Academic Courses, including the usual General, Classical, Domestic Science and Manual Training Courses.

(2) Technical Courses, including the Commercial, Boys' Industrial, Girls' Art and Girls' Industrial Courses.

The third high school offers at present only the General and Classical Courses.

The first group of courses provides general culture and prepares

for colleges and professional schools. The second group leads directly to vocations.

The Cincinnati school authorities recognize the objections which can be raised to the plan of having technical courses in the same building with academic courses, and under the same principal and teaching force. The following quotation from the Eightieth Annual Report of the Superintendent shows that definite steps are being taken in the organization of the high schools to overcome these objections:

1. The principal, the administrative officer of the whole school, and in authority over the heads of departments.

2. Heads of departments. The Boys' Technical or Industrial Course, the Girls' Domestic Arts Course, and the Commercial Course should each have a head. To the head of a department each student in that department would report. He would be the adviser also of the teachers of the special staff (in conjunction with the principal) and would be supervisor of all work of the group of students in his department. It would be the duty of the head of the department, say of the Commercial Course, to keep in touch with business interests in the city, to keep the course of study abreast of the needs of business houses, and to suggest suitable positions for his students.

3. The staff of teachers and instructors. These should be organized in departments under the above heads, and when appointed it should be with reference to their fitness for the special department. If a teacher conducts classes in two departments, the work done in each department should be under supervision of its respective head. Teachers not in sympathy with a commercial or industrial course should not be permitted to teach students in such a course in any subject. This is highly important if the courses are to preserve their integrity and are not to be made a mere blind or decoy to lure students into other courses. If we offer a commercial course, the course must be what it pretends to be, and it must be taught by expert teachers who believe in it, and there must be no proselyting into other courses.

CHAPTER VIII

INDUSTRIAL SCHOOLS AND COURSES IN OTHER CITIES (Concluded)

SHOP METHODS. ACADEMIC COURSES AND DRAWING. WAGES OF FORMER STUDENTS

The preceding chapter attempts, among other things, to show the degree in which the particular schools and courses described may be regarded as "industrial" in character, as distinguished from schools of the conventional manual training type, (a) by giving lists of shop products, (b) by stating the use to which the products were put, (c) by giving the portion of school time which is devoted to the shop and to the academic work.

In this chapter the industrial character of some of these schools is still further shown by giving under I, below, a description of methods used in shopwork, and under II, some outlines of academic courses closely related to shop and industrial needs, together with a list of reference and text-books. Under III statistics are given on the wages of students from eight trade and technical schools compared with the wages of persons trained only in the industries.

I. Industrial Methods in Shopwork

In a number of the intermediate industrial schools, special effort is made to introduce "industrial" methods and standards in the shopwork. Such methods include (a) the making of jigs to facilitate manufacture and to secure uniformity in the product, (b) division of labor to increase the skill and speed of the individual and the efficiency of the working force, (c) the appointing of students as group foremen and room foremen to develop leadership and organizing ability, (d) the use of cost and time cards and the assigning of a wage-rate for students' work, and (e) the use of a checking system to fix responsibility for poor work. Especially good examples of the use of some or all of the above shop methods may be seen in the Factory School, Rochester, New York, in the Vocational School, Albany, New York, in the Trades School, Columbus, Ohio, in the Industrial School, New Bedford, Massachusetts,

and in the optional industrial courses in grammar schools, Boston, Massachusetts. Detailed descriptions are here given of the methods used in the Boston and New Bedford schools.

1. In the Boston grammar school industrial courses,[1] pasteboard boxes were made.

The method employed was as follows: First a sample box was studied and careful note was taken of its use, of the material of which it was made, and of the details of its construction. Especial attention was called to the dimensions and to the need of obtaining accurate results, in order that all boxes might serve the purpose for which they were intended and also be alike.

Each boy then made one entire box, drawing, cutting, scoring, gluing, staying corners, pasting.

Next, by a brief talk, and with necessary demonstration, an explanation was given of the greater economy of employing "industrial methods."

Jigs were made for facilitating some of the operations and for securing greater uniformity in the product. The class was organized into different groups of from two to six boys each, each group performing one of the several operations involved in the making of the box or the cover. There were the box cutters, cover cutters, stayers, pasters, fitters and gluers. There were those who assembled, inspected, packed and counted the boxes, and there were the assistant teachers — foremen in embryo.

Of course, this was not all done in one lesson. By the time 750 of these boxes were made and packed, ready for the supply team, the boys had gained at least a glimmer of light on five points of superiority of this, the industrial method, over the method first employed: First, that there was greater economy in the use of material. Second, that much time was saved, since it was not necessary to lay aside one tool and hunt for another at the completion of a single operation. Third, that the skill increased very rapidly by performing the same operation many times. Fourth, that a standard of accomplishment in a given time was established, below which no self-respecting boy wished to fall. Fifth, that a "good" box could not be produced if any of the group of boys did "bad" work.

In passing, I must note and answer one objection which some advocates of "educational" manual training will make, namely, that the frequent repetition of the same movement is not educational, since it becomes practically automatic — a matter of the spinal cord. Be that as it may, the boys show an ever-increasing interest and delight in their work as they become more and more skillful, for there is a keen joy in mere accomplishment which is by no means a matter of the spinal cord, but of an intelligence which is much higher. It should also be noted in this connection that from time to time the groups were changed, so that in the end all the boys had performed several, if not all, of the different operations.

[1] The description here given is taken from an article prepared by Frank M. Leavitt, formerly Assistant Supervisor of Manual Training, and quoted in the report of the Superintendent of Schools, 1908.

The second project was a box smaller and more finely constructed than the first. Sixteen hundred of these were made.

In speaking of the methods used in making the later projects, it is only necessary to note two points in which they differed from those first employed: First, in the earlier project the groups were chosen with reference to the ability of individual boys and the difficulty of the several operations. In the latter the groups were formed by taking the boys in order, just as they came, and a "foreman" was appointed for each group.

Second, a system of "check" was introduced, which made it possible to trace poor work to its author — thus fixing responsibility. After the completion of the second project some calculations were made to ascertain the increase of efficiency, and it was found to be about 400 per cent.

It is rather early to speak with certainty about the interest with which the boys will follow this work, but the indications are all extremely favorable. The boys do not seem to object to giving their work to the city, but rather appear to be pleased that they can contribute something to its support, and that, in these days, is of no small consequence. Interest seems to be awakened and held by the mere productive activity — by the industrial processes themselves, and it has not been necessary, thus far, to bring in the motive of ownership, which is prominent in the regular manual-training work. The boys were interested when the supply team called to transfer their boxes to the supply rooms. Some rivalry has been noted between different groups, and some boys have asked to be allowed to work at home.

2. At the New Bedford, Massachusetts, Industrial School[2] the shopwork aims to produce, among other things, what may be called "a constructive state of mind, by putting the pupil repeatedly through the whole process of planning, expressing and constructing some piece of work which is to be used, and at the same time to develop proper shop habits." The job-shop is taken as the general model for the shopwork, the academic work being largely determined by and centered about the work on a particular job.

Orders are sent into the office from the head of any department. In the office each job is entered on a job card. On this card is placed the name and office number of the job. The shop instructor takes this card to his office and enters on it the name and number of the boy to whom he assigns the job. The boy then rings in his time on the time clock. Since the card shows from what department the order came, he goes to that instructor to get further details, which are intentionally given orally. He then goes to the drawing room, presents his job card and is given a check, a piece of drawing paper. On this he draws the work, and then takes the drawing to the man who gave the order. If all right, from the standpoint of the man who wants the article, he takes his drawing to the shop instructor to be

[2] The description here given is taken from an article by the director, Charles R. Allen, published in Bulletin No. 10, National Society for the Promotion of Industrial Education.

O. K'd. Then he gets out specifications and stock and cost figures, or any other calculations which may be needed, on the same sheet as the drawing. When these are passed by the academic teacher, he reports at the shop, entering on his sheet time spent in this work as shown by his card.

He then makes the article or does the work, gets it passed by the instructor and returns his drawing sheet to the drawing supply room. There he writes a report on the work. When this is accepted by the English teacher the job is completed, and he rings out on the job card, turning that and the article (if possible) into the shop office.

Thus in this process the boy has planned and carried out a definite piece of work, and has incidentally got his English, mathematics and some ideas of economy, has been required to carry through a number of steps in proper order and has gone through the whole process of production.

II. Drawing and Academic Courses Related to Industrial Needs

Practically all the industrial schools visited by the committee's representative are endeavoring to organize the academic instruction around industrial needs. Few of the schools, however, have gone far enough in these efforts to have definite and complete outlines of such work. This is due, in part, to the lack of appropriate text and reference books, and to a lack of time in the early stages of these experimental schools when many things need to be done.

Twelve schools were found which have developed "industrialized" courses in drawing and academic subjects to such an extent that outlines or descriptions can be here given which may be suggestive to others interested in this matter. These courses are described below, classified with respect to subject matter. In addition, courses in industrial history and civics in the continuation schools of Munich, Germany, are outlined under "history." A list of reference and text-books, obtained from instructors in industrial schools in this country, is given at the end of the section.

Mathematics

The following books and courses in mathematics have been brought out in close connection with trade and technical schools in order to supply the demand for mathematical subject matter closely related to shop needs.

1. Shop Mathematics,[3] by E. E. Holton, is based on the author's twelve years' experience as draftsman and shop foreman and on

[3] Published by The Taylor-Holden Co., Springfield, Massachusetts.

twelve years' experience in teaching in trade and technical schools. The chief feature of the book is the 38 lists of some 600 problems related to machine-shop practice. No attempt is made to explain mathematical theory or principles. Rules and formulas are given under each subject, with some explanation of their meaning and use. The book contains 211 pages, with over 62 illustrations of machines and apparatus, a list of 56 formulas, and a table of natural trigonometric functions. It is, perhaps, best adapted for use in technical high schools, after two years or more of mathematics have been completed.

2. A book of problems intended to supplement the usual algebra and plane and solid geometry of secondary schools, and the trigonometry of right triangles, has been worked out in the mathematic classes of Lewis Institute, Chicago, by Herbert E. Cobb, one of the instructors. The book is at present, November, 1910, in manuscript form, and contains over 1,200 problems, from one-half to two-thirds of which relate to laboratory and shopwork and engineering formulas. On the mathematical side these applied problems require the use of arithmetic, algebra, trigonometry of right triangles and a small amount of plane geometry. Considerable use is made of the graph in the solution of the applied problems. The remaining problems are of the geometry-algebra type, intended to interweave those subjects. Explanatory solutions of problems are given, and frequent explanations of the principles of science with some experimental work. The meaning and use of formulas are presented. Since the book is intended to be supplementary to the regular work in mathematics very little explanation is made of the mathematical principles involved in the problems.

3. Shop Problems in Mathematics,[4] by Breckenridge, Mersereau and Moore, is intended to provide the mathematics needed in the usual four-year high-school course in manual training. It should be useful as a handbook in the shops or as a supplementary book in the mathematics classroom throughout the four years. In addition to the shop problems, and the rules and formulas required, some 80 pages are given to a review of calculation, and to an explanation of the mathematical principles involved in the use of formulas and in the trigonometric solution of triangles. The book contains 278 pages, with 162 figures and illustrations of machines and apparatus.

[4] Published by Ginn & Co.

4. The following course in mathematics is offered in the Cleveland Technical High School.

Secondary School Mathematics,[5] Book I, by Short and Elson, is used in the first year. This book covers about a half-year of algebra and a half-year of geometry, with some arithmetic interwoven. Nearly all of the ten chapters contain supplementary lists of applied problems related to the science work of boys and girls.

Secondary School Mathematics, Book II, by Short and Elson, is used in the second year. This book contains the second half-year's work in both geometry and algebra. Supplementary lists of applied problems for boys, at the end of the chapters, contain problems on pulleys, gears, speeds, roof trusses, weights and forms of nuts and bolts, strength of materials, stresses on beams, tapers, etc. The lists of applied problems for girls are mainly arithmetical and are based on the cost of materials for garments, the preparation (cutting) of materials, the percentage composition of foods, etc.

The mathematics of the third year, for boys, is machine-shop mathematics, and is studied in the machine shop, instead of in the mathematics classroom. For this course Holton's Shop Mathematics[6] is used.

For the fourth year the customary course in advanced or college algebra will probably be offered.

5. The Manhattan Trade School for Girls, New York city, has developed a course in industrial arithmetic, published in book form under the authorship of Mary L. Gardner and Cleo Murtland. The book contains 53 pages of problems classified with reference to the trades taught in the school, together with problems bearing on the textile industries. No attempt is made in the book to explain the arithmetical principles involved in the problems.

6. The Milwaukee School of Trades and the Cincinnati Continuation School are developing courses in mathematics covering the mensuration, the algebra and the trigonometry needed in the trades taught. In the Cincinnati school considerable effort is made to give the student an understanding of the mathematical principles involved in the rules and formulas used in the shops.

[5] Published by D. C. Heath & Co.

[6] See p. 215 for statement concerning this book.

7. Hundreds of problems, closely related to shop needs, have been prepared for the apprentices of the New York Central Lines.[7] Some of the problems are general in character and are to be solved by all apprentices; others are related to a particular trade and are to be solved by the apprentices in that trade only.

The body of the course is arithmetic, including mensuration of plane and solid figures, but some attempt is made to introduce algebra, in a simple way, in connection with formulas. Problems on levers, gears, pulleys and strength of materials are also given.

The course is essentially a problem course, all theory, principles and rules being introduced through problems needed for solution in the shops. Practically all problems are clothed in shop language.

Drawing

1. In the New York Central Apprenticeship system a course in drawing is provided for each trade, specially adapted to the needs of that trade. No preliminary geometrical exercises are used. The drawings are entirely of objects used by the apprentices in the shops, geometrical principles being introduced when needed. Lettering is taught incidentally in connection with the title on the sheet. Blueprint instruction sheets are used, containing general directions, as well as specific directions for the individual drawings.

2. In the High School of Practical Arts for Girls, Boston, Massachusetts, drawing is closely related to the shopwork. Before a garment or hat is made in the shops, a design or working-drawing, giving full details, is made in the drawing-room, due consideration being given to the figure of the girl for whom the article is intended, and to the quality and kind of material to be used. After the article is completed in the shops, a final drawing is made, similar in character to the designs in fashion-plates and magazines. The artistic finish of these final drawings is noteworthy.

In domestic science the drawing is based on house-building, furnishings, decorations, etc.

History

1. The course in the history of boot and shoe making, outlined below,[8] was given in Brockton, Massachusetts, to fourth-year high-

[7] A full description of this system of apprenticeship, showing methods of instruction, may be found in the *American Engineer and Railroad Journal,* June, July, September, October, November, 1907.

[8] The outline was furnished by the instructor, Miss Blanche Evans Hazard.

school students, three periods a week for the regular school year. All students in the course had already taken one year in ancient history, one year in mediæval, and one in English history, and were taking American history, two periods a week, along with the industrial history.

Footwear — of primitive people in all times and places. Sandals and moccasins. Materials and form.

Footwear — of civilized nations in ancient times. Orientals, Greeks and Romans.

Medieval Industries

Medieval manorial life. Manors as self-sufficing communities compared with New England farms in the seventeenth century. Shoes made in the houses or from leather tanned on the manor. A time of household economy.

Rise of towns. Markets and merchant guilds for trade. Masters, apprentices and journeymen for handicrafts. Craft guilds and their organization.

Thomas the Tanner, and Samuel the Saddler, as topics for original stories. Illustrations of medieval footwear.

Period of town economy.

Modern Industrial Life in the Fifteenth to the Eighteenth Century

Influence of foreign intercourse.

Influence of new colonial possessions of Europe as markets for home products.

Mercantile theories and their effect upon English industries. Large amounts of capital in hands of traders without technical training, who ventured to secure and hold distant markets for products made at home. Therefore, rise of domestic system, and a time of national economy.

Development of better means of communication, i. e., canals, roads and ships.

Modern Industry in the Nineteenth Century

Conditions in England, France, Germany and New England in 1815, 1850 and 1900, showing the transition from the domestic to the factory system of production during these centuries.

Illustrations taken from the silk and linen industries in Germany and Italy, the woolen industry in England and the boot and shoe industry in New England.

Factory system slow to develop in European countries, except in cases of new industries.

Discuss low price of labor there versus high price of machinery. Discuss, also, high prices versus high cost of labor.

American-made machinery and American factory organization being introduced.

History of the Boot and Shoe Industry in the United States

Lynn, Randolph and North Bridgewater taken as typical centers.

Shoemaking in New England farmhouses by fathers and sons, or by traveling cobblers. Particularly in Massachusetts.

Apprentices in the cities and the country until 1840.

Work of John Dagyr, in Lynn, and Josiah Field, in Randolph. "Bagmen" for merchants.

Vats and tanneries in the New England towns for local tanning.

"Ten-footers" — capitalist merchants who organized the "putting-out" or domestic system.

Development of the central shop.

Conditions of market for boots and shoes manufactured in New England in the nineteenth century.

Farming communities added shoemaking to their winter's and summer's work. Army contracts made a demand for extra production in 1812, 1848 and 1861. Australia and California provided new and relatively large demands for brogans and for boots when mines were opened in the "forties."

Discussion of the means of transportation in 1830, 1850, 1865.

Conditions of finances in 1800, 1837, 1857 and 1873. Effects of these financial conditions and means of communication upon the manufacture of goods.

Study of account books of manufacturers and grocers from 1800 to the present time.

Social and industrial history of North Bridgewater from 1656 to 1910.

The Boot and Shoe Industry Passes Into World Period

American-made shoes compete with foreign shoes. Hides used in America come from various parts of the world.

Spread of American-made machinery. History of the United Shoe Machinery Company.

The making and winning of foreign markets by American boot and shoe firms. Our consular service.

Question of "free hides" and "protected" shoes.

Twentieth-century Organization of Shoe Factories

Class visits in local factories.

Study of parts and processes. Study of kinds of mental and technical skill necessary for each process or machine. The work of the office in making up tags, and of the shipping room in marketing the boots. Advertising departments and devices.

Study of allied industries in Brockton.

Modern Problems Affecting the Boot and Shoe Manufacture

Trades unions, trusts and combinations, factory legislation in Massachusetts, factory "betterment" or "social" schemes, tariff, industrial education given by the State.

Text and reference books used

Thurston: Economic and Industrial History, Part II.
Cunningham: Outlines of English Industrial History.
Cheney: Industrial and Social History of England.
Ashley: Middle Ages.
Otis Mason: Primitive Travel and Transportation, Origin of Invention, etc., published by the Smithsonian Institution.
Gulick: Life of the Ancient Greeks.
Preston and Dodge: Private Life of the Romans.
Wilkinson: Egypt.
Bogart: Economic History of the United States.
Coman: Industrial History of the United States.
Day: History of Commerce.
Johnston: Ocean and Inland Waterways, and Railroad Transportation.
Weeden: Social and Economic History of New England.
Dewey: History of Finance.
Unwin: Industrial Organization.
Schloss: Methods of Industrial Remuneration.
Bucher: Industrial Evolution.

2. The following outline of talks on printing, supplemented by prescribed reading in books of reference, was given in the Pre-apprentice School of Printing, Boston, Massachusetts, in the year 1909-10.[9]

1. Early methods of keeping records.
   Picture-writing on stone and skins.
   Invention of alphabet and writing; scribes, books, parchment, wax tablets, papyrus rolls.
   Illuminated manuscripts.
   Invention of printing by Gutenberg.
   Facsimiles of early printing.

2. Developing and spread of printing over Europe to England after invention of movable type.
   Improvement in typemaking.
   Improvement in press; Franklin.
   Modern methods; cylinder press; linotype.

3. In the coöperative course of the Lewis Institute, Chicago, one day in the week is given to lectures on industrial history on the topics outlined below.[10] On the following day students are asked to write in class on the subject of the lecture.

[9] Taken from Superintendent's Report, 1910.
[10] The outline was furnished by the instructor.

Topics in Industrial History

First Quarter (Feudalism)

1. The Manor.
2. The Guilds.
3. The Black Death. The Peasants' Rebellion.
4. Enclosures.
5. Break-up of the Guilds. Domestic System.
6. Paternalism. State regulation of industry.

Second Quarter (The Industrial Revolution)

1. Hargreaves, Arkwright, Crompton, etc.
2. Watt and the Steam Engine.
3. The Factory System.
4. Laisser-faire. Chartism. Corn-laws.
5. Factory Legislation.
6. Rise of Trade Unions.

Chief reference: Cheyney: Industrial and Social History of England.

Third Quarter (American History)

1. Industry in the Colonies.
2. The American Revolution.
3. Development of Agriculture.
4. Slavery. The Cotton Industry.
5. The Civil War.
6. Immigration.

Fourth Quarter (Present Aspects in United States)

1. Historical Sketch of the American Labor Movement.
2. Haymarket and Homestead Riots (Typical Conflicts).
3. Child Labor.
4. Labor Legislation.
5. Present Organization of Labor.
6. The American Federation of Labor.

Principal references

Coman: Industrial History of the United States.
Commons: Races and Immigrants in America.
Adams and Sumner: Labor Problems.
Mitchell: Organized Labor.
Spargo: Bitter Cry of the Children.
United States Industrial Commission, Vol. 17.

4. Industrial history and civics in the Continuation Schools of Munich, Germany.[11]

[11] The outlines are taken from bulletins published by the Massachusetts Commission on Industrial Education, Boston.

For mechanicians' apprentices

Industrialism: History of manual work in general; development of the trade of mechanician in particular; individual important mechanical contrivances of ancient times and the Middle Ages (building of the pyramids, means of transportation, conducting of sieges, etc.); the most important of the ancient masters of mechanics (Chersiphron, Metagenes, Ktesibios, Archimedes); the development of mechanics with the advancement in the knowledge of physical laws (Galilei, Newton, Franklin); the development of mechanics during the last century (Watt, Stephenson, Fulton); the most important persons in the field of electrotechnics (Volta, Galvani, Oersted, Schweigger, Ohm, Faraday, Gramme, Ruhmkorff, Siemens, Bell, Edison, Schuckert); the chief fields of practical mechanics in our own times, their gradual dividing up into special departments; the protection of designs; allied industries; the most important features of the industry; examinations for journeymen and master workmen.

Citizenship: The communal organization; problems of the community; the handworker as a member of the community; his rights and duties; titular officials in the community; problems of states union; the manual worker as a citizen of the state; his rights and duties; titular officials of the state. The state constitution of Bavaria; the Bavarian government. The constitution of the German empire; its problems. Social legislation. Commerce and traffic in the nineteenth century, and their significance for the interests and welfare of the citizen. Value of the German consulates in foreign countries.

The citizen of the state in public life: Human society — the social and economic differences in it; their origin, necessity and present development. General social and general economic arrangements (lawmaking, maintenance of rights, security, culture and well-being). The participation of the citizen of the state in the advancement of the general interest of life. The advantage of living under states union. The economic and cultural position of Germany in the world. Supplementary matter from industrial laws, especially legal rules regarding machinery and the running of factories; directions for the prevention of accidents.

For jewelers' and gold and silver workers' apprentices

Industrialism: History of handwork in general; the development of the gold and silver smith industry in particular; the accomplishments of the ancient eastern peoples in this field, and their progress in the art up to the present time, especially that of the East Indians, Japanese and Chinese; the metalwork and ornaments of the ancient Romans; the development of the industry among the people of the north, and especially in the development of the ecclesiastical art work of the Middle Ages (enamel and filigree work). The influence of Italy in the Renaissance under Cellini. The German masters of that time (Jamnitzer, Eisenhoit and others). The importance of France in this field since the eighteenth century. The present condition of the industry, and the more recent advances (Tiffany, Lalique). Important places of manufacture of the past and present. Related industries. The

present-day division of the work — the most important, from the industrial point of view. Journeyman's and master's examination. (As being closely connected with the industrial instruction, the pupil is introduced to the chief features of the characteristic forms of the productions of his industry.)

Geography-history[12]

1. In the Cleveland Elementary Industrial School[13]

I. Iron and Steel Industry

The age of steel

1. Iron ore; its value.
2. Distribution of ore in Lake Superior region.
3. Ease in mining with labor-saving devices; speed of steam shovel.
4. Transportation of ore from mines to boat; speed in loading an 8,000-ton ore boat; unloading.
5. Blast furnace. Description. Contents of furnace.
6. Connellsville coke. One hundred and forty-mile journey to Cleveland.
7. Making of pig iron.
8. Making of wrought iron; its uses.
9. Steel: Bessemer converter.
10. Steel has revolutionized farming, war, transportation. Influence on railroads, bridges, buildings.
11. Location of iron and steel centers.

II. Lumbering

Wood

1. Structure: Pith; wood; bark.
   (a) Pith: Center, soft, valueless.
   (b) Wood: Sapwood, heartwood, value of each.
   (c) Grain: Edges of annual rings. Woods of beautiful grains — specimens. Value of grain in beauty and durability.
2. Value of forests: (a) Construction. (b) Buildings; furniture. (c) Pavements, fences. (d) Fuel; pitch; tar; turpentine. (e) Paper, hemlock bark, maple sugar, nuts, etc.
3. Lumbering: (a) The logging camp; time of going into woods; why? (b) Building of camp; life. (c) Control of streams. (d) Cutting, brushing, felling, branding. (e) Log-skidding; the ice road. (f) Banking ground and edge of river bank.

[12] An excellent outline of a course in commercial and industrial geography for seventh and eighth grades may be found on pages 236 to 250 of the *Syllabus for Elementary Schools,* New York State Education Department, Albany, New York.

[13] The outline was furnished by the instructor, Miss E. Freedlander. Lantern-slides, obtained from the Keystone View Co., Meadville, Pa., are used in the course.

4. Log-driving: (a) Time of year and conditions. (b) Hardship of rivermen's lives and dangers. (d) Control of stream, dams and log chutes. (d) A log jam and its dangers. (e) Sorting and rafting — the logs at the "boom." (f) Rafting logs to the sawmill.

Manufacture

(a) Making logs into lumber. Sawmill; location and kind of power.

(b) Location of boom for holding logs: Saw-room and its machinery; saw carriage; kinds of saws — circular, band, gang; dry kiln; planing mill.

(c) The sawing operation: Carrying logs into mill from boom. Sawyers and saw carriage which holds log and carries it against rapidly moving saw. Drying and dressing. Sawdust and use. Piling in great stacks on docks or in yards.

Location of Forest Regions

1. Pineries: (a) Maine, New Hampshire, Vermont. (b) Northern Minnesota, northern Wisconsin, northern Michigan. (c) Western Washington, western Oregon, western California (especially redwoods), specimens.

2. Hardwoods: (a) Ohio valley; locate by States; conditions at present in Ohio, Indiana, Kentucky. (b) States producing most of the hardwoods to-day; our outlook in this field. (c) Great value; industries dependent on it.

3. Yellow pines and cypress

   (a) Yellow pines: Value and uses of wood. Commercial use of sap. Ports of export — Charleston, Savannah.

   (b) Cypress: Method of lumbering in swamps; value; where wood is in contact with water. States producing: Louisiana, Mississippi, Alabama, Florida, Virginia, North and South Carolina.

Marketing of Lumber

1. Lake boats — Duluth to Cleveland; trace journey.
2. Minneapolis — in heart of region. Center of raw material. Easy, cheap transportation. Waterfalls cheap power. Distributing center.
3. Lake ports engaged in shipping lumber.

Mapwork: Western ports; kinds of lumber; markets.

Forest reserves: Conservation of forests. Object of forest reserves. Work of government.

III. Agriculture

Wheat (Correlate with breadmaking)

1. Widespread use in ancient and modern times — staff of life.
2. Varieties of wheat, and States raising it, and use: Winter wheat, spring wheat, durum.
3. Preparation of soil: Plowing — steam plow, sulky plow, gang plow; harrowing, planting — pictures of machinery.
4. Harvesting: Time and condition of grain. Old implements: Cradle, reap hook. To-day: Self-binder, steam header and thresher.
5. Threshing. Flail, modern machine. Life on farm during threshing season..
6. Marketing grain
    1. Hauling to grain elevators.
    2. Grain-collecting cities of West and immense elevators.
    3. Movement of wheat by rail: Northern Pacific, Great Northern, Chicago, Milwaukee & Puget Sound.
    4. Cities engaged in handling of wheat: Minneapolis as a center, Chicago, Milwaukee, St. Louis, San Francisco, Seattle, Tacoma.
7. Manufacture

    Flour: Old methods of grinding, present patent roller process. A great flour mill — process explained with specimens. Flour production — cities.

IV. History

1. History of Cleveland.
2. Civics — the government of Cleveland in detail.
    (a) Charter.
    (b) Council and mayor, with respective duties.
    (c) The departments.
        1. Public service, with its subdivisions and work of each.
        2. Public safety.
3. In study of industries, historical background introduced, for instance:
    1. In commerce of Great Lakes, the history of Great Lakes, beginning with French explorations.
    2. In study of railroads — the history of the Union and Central Pacific R. R., with the difficulties of the undertaking.
    3. In lumbering, in the hardwood forests, Daniel Boone and the early pioneers in Ohio Valley.

Science

1. Industrial chemistry in the high school at Menomonie, Wisconsin.[14]

The first semester is devoted to a thorough study of the basic principles and phenomena. In order to cover this work in an adequate manner, it has been necessary to reduce the subject-matter to the fundamentals, leaving out much that is in the average text-book. This has resulted in one decided improvement — the elimination of much of the non-essential, theoretical work, likely to be so dear to the heart of the specialist and worth so little to the high-school student. During the second semester two lines of study are carried on. The girls study household chemistry and the boys have industrial chemistry. To facilitate progress, boys and girls are put into separate sections. In fact, they are segregated from the beginning, but this is more a matter of convenience than of necessity, as far as the work of the first semester is concerned.

The work in household chemistry may be grouped under three heads: the chemistry of foods, of breadmaking, and of cleaning. The different classes of foods and their general reactions are studied. Whenever it is possible, the different food principles are extracted from the foods in which they commonly occur. For example, in the study of proteids collagen is extracted from bone and converted into gelatin. Tests are made on the solubility of syntonin in lean meat. Studies are made on albumin from eggs, casein from milk, and a proteid from some vegetable. In the study of sugars, glucose is prepared by the hydralization of starch which the student has previously extracted from potatoes. An effort is made to familiarize the student with the common foodstuffs and with the changes they undergo in cooking.

The work in breadmaking includes the fermentation process, a study of the necessary and favorable conditions for the growth of the yeast, with regard to food supply, moisture and temperature. In connection with the study of bread raised by the non-fermentative process, baking powder and soda are subjects of consideration. Tests are made for ammonium, cream of tartar, phosphate and sulphate powders. A cream of tartar powder is prepared, the best proportionate amounts of soda and tartrate being determined by experiment. The reactions of various acids, such as hydrochloric, lactic and tartaric, with soda, are noted; also the reactions of acid salts.

The chemistry of cleaning involves a study of the chemical nature of stains, such as grease, blood, paint, rust, ink, fruit, tea, coffee and grass stains, with the different cleaning reagents and their proper application. A kitchen cabinet of cleaning reagents is prepared and labeled as to composition and use.

The following experiment is chosen from the work on soapmaking:

> Dissolve 15 g. of potassium hydroxide in 120 c. c. of water and pour half of this into a porcelain evaporating dish of at least 500 c. c. capacity; add 60 c. c. of water and 50 g. of tallow. Boil this solution for three-

[14] The outline here given is taken from the *School Review*, October, 1910.

quarters of an hour, carefully replacing from time to time the water which has been lost by evaporation; then add the remainder of the solution of potassium hydroxide and boil at least an hour more. Water should be added as before, but the volume of the liquid may be allowed to decrease about one-third. Cool. What are the properties of soft soap? Use? Add 20 g. of salt, boil for a few minutes and allow the liquid to cool. The soap will rise to the top, and the glycerin, excess of lye and salt will remain in solution. Write chemical equation representing reaction for formation of soap.

The industrial chemistry for the boys covers a study of clays and brickmaking, cements, mortars and glazes, the sources and preparation of illuminating gases, fuels, the softening of water and tests of its purity, bleaching and oxidizing agents, the extraction and clarification of beet sugar, making of matches, the denaturing and quick vinegar processes, alloys and amalgams, covering the preparation of brass and solder, preparation of common compounds, manufacture of pigments and inks, blowpipe analysis of some native minerals, electrolysis and electroplating, preparation of varnishes and stains, a little work in photography and some agricultural chemistry. In this course certain basic work is required of all. Beyond this there is some individual adaptation of experiments, so that each pupil does not personally conduct work in all of the subjects indicated.

The following experiment is chosen from the study of fuels:

To determine the fixed carbon in coal. Heat about 2 gm. of pulverized coal in a porcelain crucible closely covered as long as any smoke is given off. Weigh. To what is the loss of weight due? What remains in the crucible? Heat the remainder, with cover removed, in a blast flame until all the carbon is burned out. Weight. The second loss in weight represents the fixed carbon in the coal. The incombustible remainder is ashes. Compare your results with the following table:

	Water	Volatile Matters	Fixed Carbon	Ash
Lignite	18.00	20.00	50.90	10.20
Bituminous	1.97	38.60	54.15	4.10
Cannel	Undet.	37.20	61.60	1.20
Anthracite	3.09	4.28	83.81	8.18

Compare the retail prices of the above coals and their fixed carbon content. Would this hold true if we lived in a coal-mining district? Why? Coke has a high carbon content. Its price is relatively low. Why?

2. Physics in the Technical High School, Cleveland.[15]

Throughout the work, both for boys and girls, the laboratory apparatus is of the simplest, much of it being made in the shops of the school, and the laboratory work aims to make clear to the student the principles of physics

[15] The outline was furnished by the instructor.

rather than to be a research course for the purpose of elaborate proof of the laws of physics. Boys' and girls' classes are segregated.

Boys' Physics

First term: mechanics, 12 weeks.
Second term: sound, 2 weeks; light, 2 weeks; heat, 8 weeks.
Third term: electricity, 12 weeks.

Mechanics

1. Machines with special reference to the boys' shop experience. Problems from the shops. Applied problems in transmission of power by belts, gears, etc., width of belts for given power transmission, finding delivered horse-power by Prony brake. The definitions are in engineering terms and the engineering units of power, work, energy, and others are given as needed, after the appetite for them is aroused.
2. Parallel forces and parallelogram of forces. Much rich material for this part of the work has been furnished by the foreman of a telephone-line construction gang and by a firm building bridge and roof trusses.
3. Dynamics, accelerated motion, falling bodies, kinetic energy, curvilinear motion, treated rather briefly and in engineering units, are given in a comparatively simple manner.
4. Fluid (liquid and gas) pressures, gas laws and specific gravity.
5. Strength of materials. Stresses and strains, elasticity, elastic limit, etc. Tensile, transverse, compression and shearing strength are treated. The material and proportions to be used in furniture and machine design are computed so that no part will be loaded with needless weight, and yet every part will have a reasonable safety factor for its maximum load.

Sound and Light

A brief course in the fundamentals, with explanations of the most common phenomena.

Heat

Special attention is given to the coefficient of expansion as applied to patternmaking, foundry practice and steam engineering. Indicator cards are made for steam engines. Gas engines are studied in correlation with the making of gas engines by boys in the machine shop.

Electricity

The course in electricity differs widely from the usual course in this subject. Most text-books follow the historical line of development, that is, spend most of the time in studying frictional and static electricity, and devote little to the many applications of the present day. The boy usually has a magnet, a battery and a toy motor long before he reaches high school. This line of interest is followed in this course.

1. The magnet and magnetic field as shown by iron filings.
2. Revolving a loop of wire in the magnetic field, cutting the lines of force, the simple D. C. dynamo.

3. The electromagnet, same field set up by a coil, with its many applications, three type cells, open-circuit, closed-circuit and storage.
4. The action of two fields, the galvanometer and D. C. motor and the modern switchboard instruments.
5. Modern forms of electric lamps, power consumption, light and efficiency of each.
6. A. C. generator, induction coil and transformer.
7. The modern three-phase alternator with its distribution system.
8. D. C. motors, induction motors.
9. Static electricity, X-ray, wireless, etc.

Girls' Physics

The girls physics begins the first term with heat instead of mechanics. Heating and ventilating, temperature in various methods of cooking, influence of heat and moisture on different textiles, refrigeration, etc., with a little mechanics worked in, as required, furnish a term's work.

The second term sound and light, with a little mechanics incidentally introduced. The effect of different artificial lights on the color of fabrics and the effect of color decorations on light and dark rooms in the home are considered.

In the third term the applications of electricity in the home are especially emphasized and many of the modern electrical appliances are tried out, their current consumption measured and cost computed.

Reference and text-books

In conversations with instructors in the various schools visited by the committee's representative, an effort was made to find out what books were used by the instructor in organizing the academic subjects around the shop and industrial needs. The following list of books was obtained in this way:

Mathematics

1. *Machine Shop Calculations,* by Fred H. Calvin, published by the Hill Publishing Company, 505 Pearl street, New York.
2. *Mechanical Engineer's Handbook,* John W. Wiley & Sons, New York.
3. Kent's *Formulas in Gearing,* Browne & Sharpe Manufacturing Company, Providence, Rhode Island.
4. *Elementary Algebra and Mensuration,* by Carl S. Dow, American School of Correspondence.
5. Castle's *Workshop Mathematics,* Macmillan Company, New York.
6. Duncan's *Applied Mechanics,* Macmillan Company, New York.
7. *Tables for Engineers and Business Men,* University Press, Knoxville, Tennessee.
8. *Useful Information for Business Men,* Jones & Laughlin, Pittsburgh, Pennsylvania.

9. *Handbook of Arithmetic and Geometry,* for apprentices of the Fore River Shipbuilding Company, Quincy, Massachusetts.

10. *Ludlow Textile Arithmetic,* C. R. Kaplinger Company, Springfield, Massachusetts.

11. A number of pamphlets containing formulas for mechanics, published by the Industrial Press, 49-55 Lafayette street, New York.

History

1. Coman's *Industrial History of the United States,* Macmillan Company, New York.
2. Thurston's *Economic and Industrial History for Secondary Schools,* Scott, Foresman & Co., Chicago.
3. Bogart's *Economic History of the United States,* Longmans, New York.
4. Dopp's *Place of Industries in Elementary Education,* University of Chicago Press, Chicago.
5. *American Inventors and Inventions,* D. Appleton & Co., New York.
6. *The Story of Iron and Steel,* D. Appleton & Co., New York.
7. A pamphlet on the early development of the silk industry, published by the Brainerd & Armstrong Company.

Geography

1. *The Geography of Commerce and Industry,* Educational Publishing Company.
2. Day's *Commercial Geography of the World.*
3. Carpenter's *Geographical Reader of North America,* American Book Company, New York.
4. Adams' *Commercial Geography,* D. Appleton & Co., New York.
5. Olin's *Commercial Geography,* American Book Company, New York.

Civics

1. Foreman's *Civil Government,* American Book Company, New York.
2. Dunn's *The Community and the Citizen,* D. C. Heath & Co., Boston.

III. Wages of Students from Trade and Technical Schools

Figures 6 to 11, following, give the wages received by students from eight trade and technical schools, compared with the wages of persons trained only in the industries. In so far as the statistics for the industrial schools are not affected by selective factors such as family influence and economic status, the figures 6 to 11 show the superior value of training received in industrial schools over training received in the industries alone.

Fig. 6. Comparison of wages of mechanics having only shop training with those having trade-school training

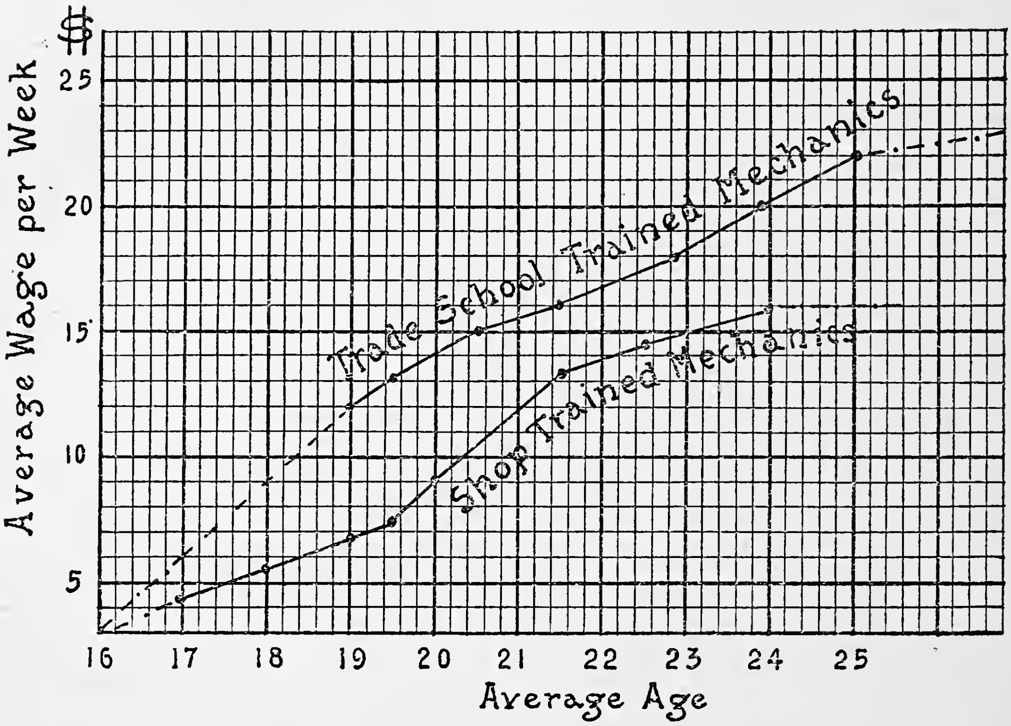


Fig. 6 is taken from Person's *Industrial Education,* and is based on statistics gathered by James M. Dodge, from employees in the Link Belt Engineering Company, the Dodge Coal Storage Company, and similar lines of business. The records of trade-school trained mechanics are from about twenty-five employees who had received their training in the Williamson School of Trades [see page 190].

Fig. 7

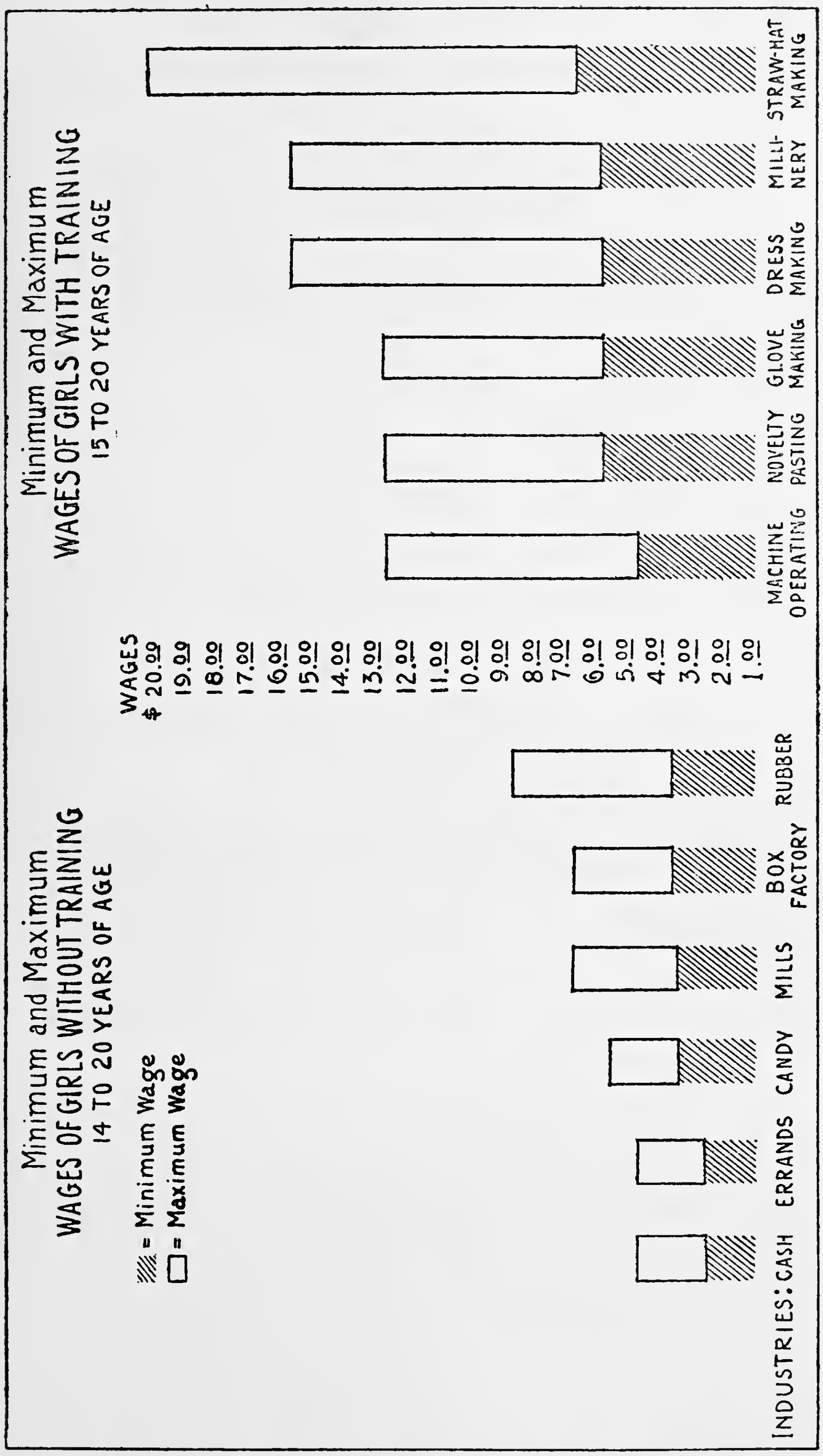


Fig. 7 is taken from an article by Florence M. Marshall, in *Charities and Commons,* October 5, 1907.

FIG. 8. WAGES OF 1,120 FORMER STUDENTS OF HEBREW TECHNICAL SCHOOL FOR GIRLS, NEW YORK CITY

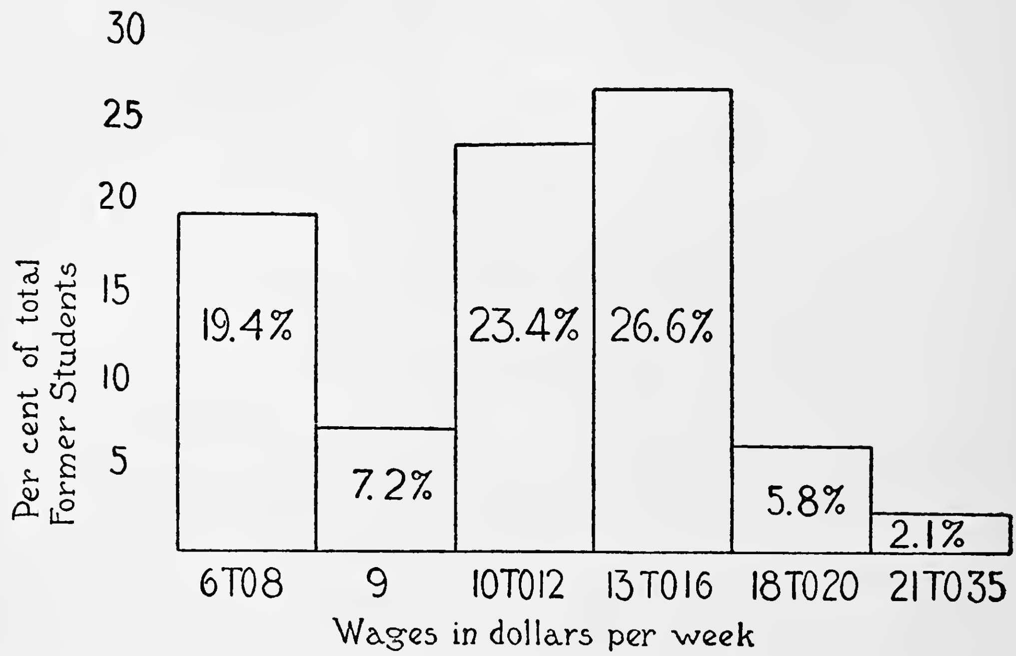


Fig. 8 is drawn from statistics taken from the President's Report for 1909.

Fig. 9 is taken from an article by Susan M. Kingsbury, in the Report of the Massachusetts Commission on Industrial and Technical Education, April, 1906. The statistics of boys with technical-school training are of students from the California School of Mechanic Arts, San Francisco (a four-year trade school), and from the Technical High School, Springfield, Massachusetts.

Fig. 9

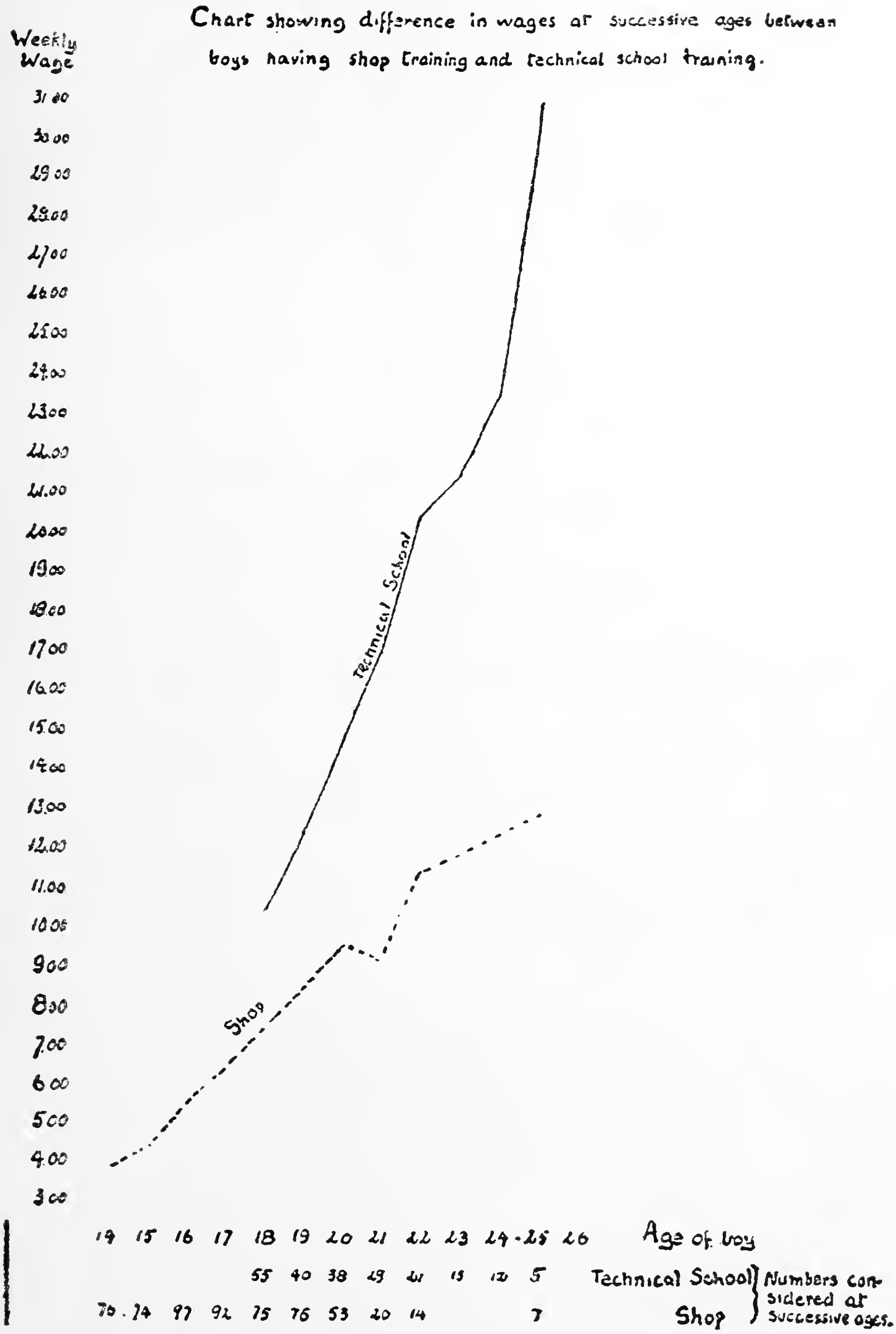


Chart showing difference in wages at successive ages between boys having shop training and technical school training.
Weekly Wage
Technical School
Shop
Age of boy
Technical School
Shop
Numbers considered at successive ages.

Fig. 10. Wages of 634 Graduates of the Hebrew Technical Institute, New York City

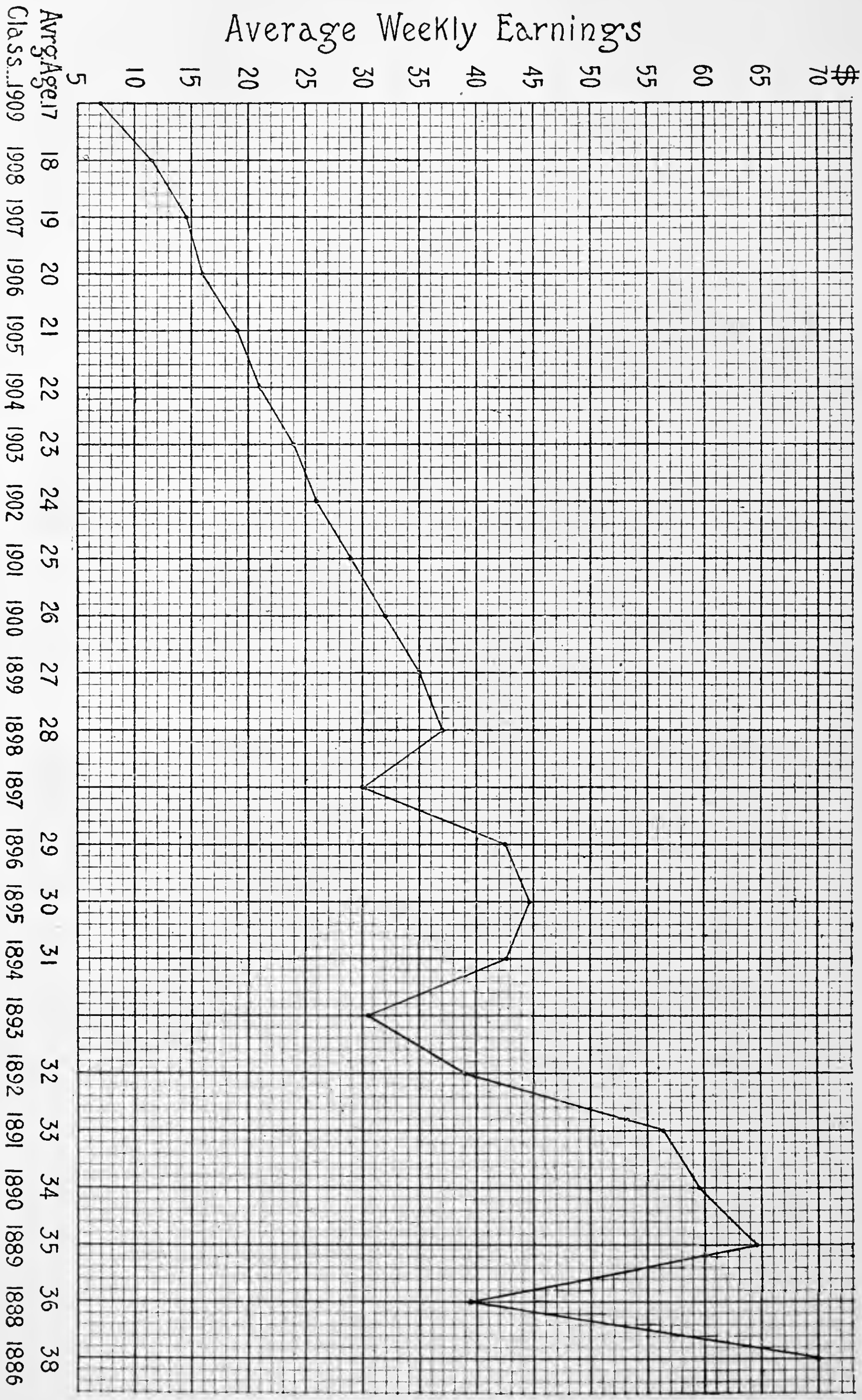


Fig. 10 is drawn from statistics furnished by the principal, Edgar S. Barney.

Forty-two per cent of the students from the Hebrew Technical Institute who have been out of school ten years or more are holding positions as foremen, superintendents, or proprietors, according to a statement of the principal.

FIG. 11

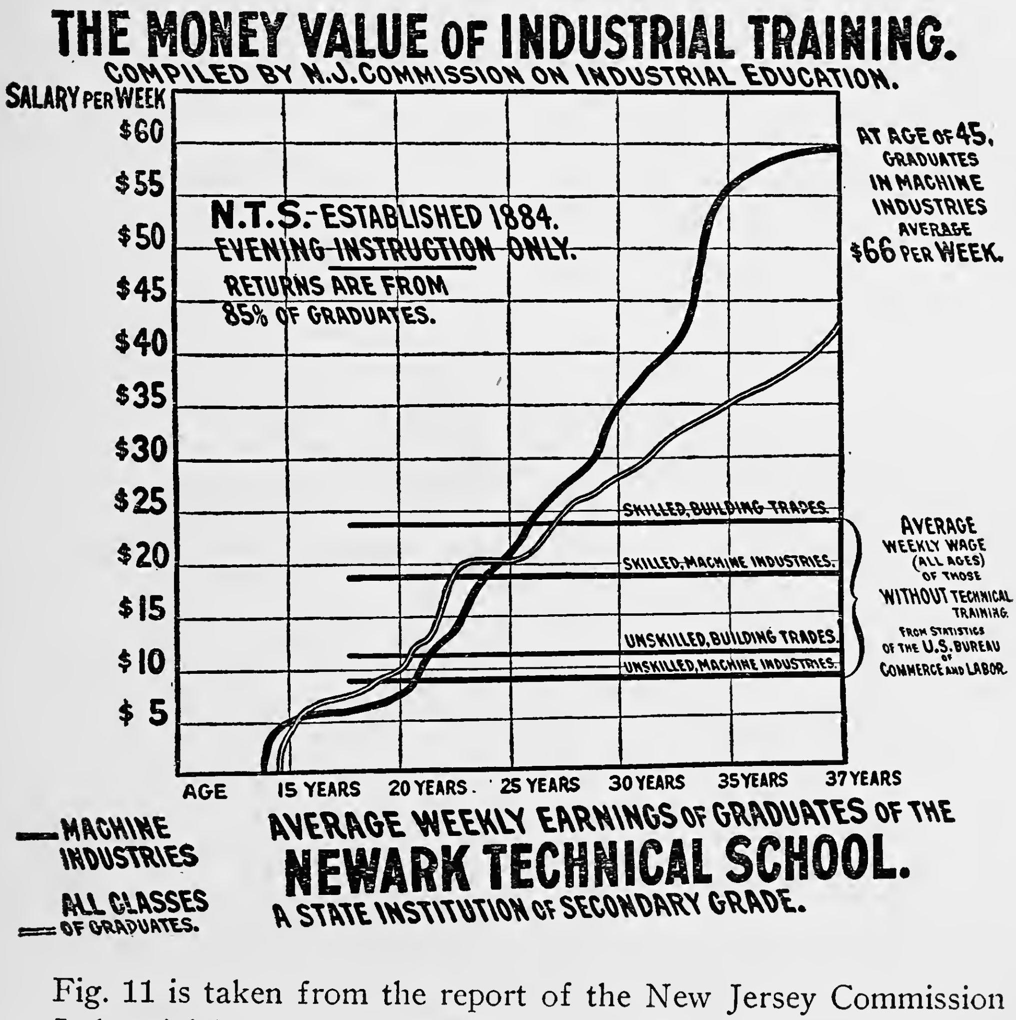


Fig. 11 is taken from the report of the New Jersey Commission on Industrial Education. The statistics on the Newark Technical School are based on returns from 226 graduates.

PART III

COMMERCIAL EDUCATION IN CHICAGO AND IN OTHER CITIES

BASED UPON A REPORT TO THE SUB-COMMITTEE

By
WALTER C. CAMPBELL
Special Investigator for the Sub-committee

CHAPTER IX

SUMMARY OF RESULTS. SCHOOLS IN OTHER CITIES

Commercial education in Chicago exists obviously on account of the necessity for training young people for business positions. This necessity is recognized by business men who expect new employees to be able to take up work in their offices without a great deal of preliminary instruction; it is realized most acutely by parents who wish their children to become wage-earners in order to help out the family budget; and it is realized by the young people themselves[1] because they expect a commercial education to fit them to succeed in business life.

That the need of business training is great is shown by the fact that 31.5 per cent of the total number of students enrolled in the high schools of Chicago elect a commercial course,[2] that 19,000 (estimated) pupils are enrolled in the forty or more commercial schools,[3] and that the Y. M. C. A. and parochial day and evening schools are providing for thousands more. The demand for commercial education has thus far been met by the high schools, by the private business colleges, by the Y. M. C. A. and by correspondence schools, by parochial business schools, by schools organized by social settlements or by employers, and finally by the University of Chicago and Northwestern University in their Schools of Commerce.

Whether the training received in these schools fully meets the business needs of Chicago is doubtful, especially in view of the statement of many business men[4] and teachers[5] of Chicago. The

[1] See Chapter XIII.
[2] See Chapter XII.
[3] See Chapter X.
[4] See Chapter XI.
[5] See Chapter XII.

general opinion of employers is that people come to them lacking the theoretical education and practical training which ought to fit them to take up routine office work immediately and to qualify them to compete for the so-called directive positions in business. The young people lack in the first place a general education broad enough to enable them to see all sides of a new proposition; and in the second place, they lack the special training which should provide them with an equipment which they can apply to new propositions.

In spite of this fact there is no insistent demand on the part of employers for a change in our present system of commercial education. They take what comes to them and do the best they can with it. Some business houses expect to train their employees. One concern in the city has been taking some pride in the fact that it takes in untrained office people, makes first-class clerks of them, and sends them to other businesses.

The employers do admit, however, that they do not get the kind of help they want. They say rather unanimously that the young people come to them deficient in the common branches, that they would rather have older people and people with a general high-school education, at least, and that the present commercial courses in the high schools are very weak.

At the present time the employers do not rely upon the high schools or commercial colleges for their help. If they want a stenographer or a bookkeeper they do not ask the high school or the business college to provide one. This is, undoubtedly, true for all the larger business houses; the smaller business men were not investigated in this inquiry. The general consensus of opinion among business men is that business colleges are little better than the public schools in the character of commercial work. The deficiencies are the same in both types of school.

It is expected in this report to inquire only into the work of the public high schools, the private business colleges, and the Y. M. C. A., the other schools offering commercial courses being of a nature not capable of comparison with these other three types of schools.

Commercial courses in public high schools

In sixteen (16) of the high schools of Chicago a regular commercial course practically uniform throughout the city is offered. Commercial studies are offered in addition to the academic work and are elective. Among the subjects studied in the course are

bookkeeping, stenography and typewriting, commercial law and commercial geography and some economics, and other associated subjects such as English composition, spelling, modern languages, arithmetic, etc., which are not given with a view to business practice but rather to meet college entrance requirements.

There is no separate commercial department with a departmental head and no separate corps of teachers. Those teaching commercial branches complain that the work receives little encouragement from the public-school officers, that it is lacking in equipment, in time (especially for practice work) and in an atmosphere of practical business.[6] In addition, those who elect the commercial work are handicapped by the excessive amount of academic work required because courses are planned to meet college entrance requirements.

In spite of this 31.5 per cent of the students elect this work, and thousands are leaving the high schools and going to business colleges. It is said that over 75 per cent of the high-school students drop out at some time during the four-year course.[7] A large number of these drop out because of the necessity for going to work; a number of others because of the attraction of good wages, even though under no immediate necessity of working. Some are restless and actual business work is more attractive than attendance at schools; and some can not keep up because of intellectual weakness, which makes further study in high school uninviting to them. A large number leave high school to finish their course in business colleges, the chief influence in such cases being the belief that business colleges offer more practical work and that greater possibilities of earning a living come after business-college training.

The chief criticism against the high schools is that the work is not practical, is not conducted by teachers trained especially for business work, nor in an atmosphere which even begins to approach that of actual business. Under such conditions, it can not be expected that the work will interest the student in the first place, or, having interested him, that it will prove of value to him in the end.

Private commercial schools

The forty or more commercial colleges, on the other hand, offer apparently exactly what the students desire, a commercial education only. The average commercial college presents an air of business;

[6] See Chapter XII.
[7] See Chapter XIII.

the equipment is quite adequate and the plan of work, especially on the technical side, seems at first desirable. The students are offered a course in business theory and practice which seems suited to fit them for the ends desired.

Criticisms may, however, be made upon the work of the private business college. Only a few of them are really efficient, and in every case the course is too short. The whole attempt is to drive the student through in as short a time as possible, this being, of course, an attractive feature in the case of the student who must be a wage-earner immediately after he graduates; from his point of view the sooner he graduates the better. The business colleges will take students ordinarily without regard to age, though several maintain they take no one under fifteen years. They pay little attention to previous training and do not take into account the natural adaptability or ability on the part of the student, i. e., no attempt is made to inquire whether the prospective student is fitted to become a business man either in a directive or directed position. All is grist that comes to the business college mill.

A further criticism is that business colleges feel that they are under the necessity of keeping their attendance, to pay dividends on their capital, and therefore conduct a vigorous campaign of solicitation which extends even to the pupils in the grammar schools. It is estimated that 25 per cent to 35 per cent of their gross receipts are paid out to solicitors.[8] It is, perhaps, pertinent to inquire if this money could not be more profitably expended by the business colleges themselves in equipment or teaching staff.

They also need public supervision. They are not open to inspection by the public officers and are not regulated by the school board or other school authorities.

The typical commercial course in commercial colleges includes bookkeeping, commercial arithmetic, commercial law, penmanship, business correspondence, shorthand and typewriting, and what is called English, including reading, writing, spelling, grammar and, in some cases, history, geography, arithmetic, etc. The average time for such a course is about eight months, and the average tuition is about $11 per month.

The commercial colleges themselves insist that their methods are the correct ones, that their course is arranged to give the maximum of practical work in the minimum of time, that the course is con-

[8] See Chapter X.

ducted by teachers especially trained for business work who make it a practice to keep in touch with the latest business methods, and that, therefore, their courses are much more efficient than can be given in the public high schools at present. It is true, however, that the greater number of students turned out by the commercial colleges, as well as by the high schools, are inefficient, except possibly in a mechanical way;[9] and they still require detailed instruction in that which they are supposed to have learned in school. The business training of the public schools and of the commercial colleges does not fit their graduates to take up business work with the expectation of working themselves into positions of responsibility.

Commercial courses in the Y. M. C. A.

The continuation work in the day and evening schools of the Y. M. C. A. has been to some extent more successful than work in the high schools and commercial colleges largely because of the nature of the students. The Y. M. C. A. classes are attended by boys who are anxious to advance, boys who realize their needs in certain lines, some of whom are already employed, some, indeed, being sent by employers who pay their tuition. In addition to this, the teachers are people actually engaged in the work they are teaching. The instructors in bookkeeping, for example, in these schools, are men actually working during the day in some office, or are men taken from some large concern and put in charge of the work in the Y. M. C. A.

In general, the courses offered are about the same as those in the commercial colleges, i. e., bookkeeping, commercial law, business practice, stenography and typewriting, etc. In addition, the Y. M. C. A. offers special courses in advertising, real estate salesmanship, finance and investments, conducted by business men experienced in these lines of work. The time required to complete a course in bookkeeping or in stenography and typewriting is six to nine months. The Y. M. C. A. takes nobody under fifteen years of age and the average age of students is twenty-two years. The average enrolment in the evening schools is about 250 for the year.

The Y. M. C. A. also makes a special effort to coöperate with business houses. It is true, of course, that the commercial colleges maintain employment bureaus and through them manage to fulfil

[9] See Chapter XI.

their promises to graduates to provide them with positions, but they do not make the effort made by the Y. M. C. A. in putting its graduates into the best positions, nor do they try as the Y. M. C. A. does to use " part time " or " continuation " work.

Summary of conditions

The general criticism, then, on the whole situation in commercial education in Chicago is that the work is not designed to meet the special needs of Chicago. The business of Chicago is largely that of selling and transporting merchandise. The majority of the employees are perhaps in jobbing houses and railroad offices. In addition to these, there are large numbers of employees in manufacturing industries, department stores, and mail-order houses. These businesses need men who are capable of taking responsibility very early in their business careers. Some of the large jobbing houses in Chicago are sending men to the various colleges in the country to interview graduates for the sole purpose of getting men who are able to work rapidly into responsible positions.

The business courses in the schools of Chicago, public and private, are not designed to produce such men. Business colleges are not meeting the demand, for they pay no attention to such matters as the previous general training of their students or their natural ability. As one employer says, " a great many good mechanics are spoiled in making very poor clerks." Pupils should be trained for that line of work for which they are suited.

The work of the public schools is distinctly not work of the business type. It is so inadequate that for this reason students leave the schools, even when not obliged to from necessity to work, and even when not prevailed upon to leave by commercial colleges. Those taking the public-school course or those graduating from business colleges are likely to become mere machines.

It is, perhaps, interesting to inquire to what extent business in Chicago adjusts itself to meet this situation. Some business men who say they get the kind of help they want have their business so systematized that one clerk does one kind of work the whole day through. Is it not, perhaps, true that this division of labor has come about as much from lack of well-educated office employees as from advanced business organization?

The students in the commercial colleges pay about a million and a half dollars in tuition. Why could not this million and a half dol-

lars of the money of citizens of Chicago be invested in commercial high schools or courses offered in the present high schools which would be designed to meet the needs of Chicago's business?

Remedies

It has been apparent for some time that some other plan of educating the young people for business should be adopted and followed out vigorously.

Two schemes have been suggested. One is the establishment of separate departments of commercial education in the present schools with separate directors of commercial work and a separate corps of teachers. The work is to be the same in all the high schools coördinated under efficient leadership and supervision over the whole city. The purpose is to " give business courses based on business methods by instructors who know business methods." While it is thought that the four years' course of equal grade with the regular academic instruction is the very best scheme for giving the most thorough commercial work, it has also been suggested that a course of two years' duration should be offered which would meet the demands of those obliged to leave school early to go to work.

The second plan is the establishment of a separate high school, or, perhaps, one central high school and three branch schools, one each for the north, south and west sides. Such a high school would be technical in character after the manner of Crane and Lane Technical High Schools, and would have no direct connection with other high schools. It would be under the control of a separate director of commercial work and would, therefore, have not only the advantage of giving business atmosphere, but that of inspiring both teachers and students with a business spirit and patriotism for their school which would give added force and impetus to their work.

Whichever one of these plans it is thought best to adopt, the coöperation of the business man of the city is one of the most necessary factors. An advisory committee of business men could render service of great value to such a school by giving counsel as to the course of study and in visiting and inspecting the schools and giving criticism of the work being done. Business men and business houses could take students for part-time work during the school year, or full time during the summer vacations.

This plan has been tried in some manual training schools and seems very successful. Lewis Institute coöperates with a number

of factories in the city in a scheme whereby every student works during the school year, part of the time in the school and part of the time in the factory. Interviews with the instructors of the school, and with the business men and with some of the boys in the classes show the arrangement to be very successful.

It would be more difficult in some cases to apply the part-time scheme to officework, salesmanship, etc., but there are very few business houses in Chicago which could not employ the students during the summer. It is the time of vacations for regular employees and the business houses actually need additional help during these months. Another form of coöperation could be found in affording opportunities for teachers and classes to visit the various offices, to make a thorough inspection and study the work at first hand.

The definite aim of such commercial work would be to make it fit the ends of Chicago business and a definite effort should be made to provide courses capable of fitting men to work rapidly into directive positions.

The two schemes of commercial education suggested above are the types in use in the high schools in other large cities in the United States. The separate high school of commerce is used in Boston and Cleveland. The commercial department for all high schools in the city is used in St. Louis, and will be adopted in Cincinnati in the coming year.

The Boston High School of Commerce

The Boston school has been established since 1908. It was organized in the first place in 1907 by a committee of twenty-five business men whose recommendation was immediately accepted by the school board. This was the first coöperation for commercial education between business men and school authorities in the United States.

The course of instruction is twofold in character. In the first place, the general high-school subjects are taught to provide the student with general knowledge and to prepare him for college, if he so desires; and in the second place these general subjects are taught with an eye to their value in commercial and business work while a special commercial training of the most thorough character is provided.

Separate departments are maintained with separate heads who take the responsibility for their departments and share in the executive work of the school. These departments are first, that of Busi-

ness Technic, where classes in Bookkeeping, Phonography (stenography) and Typewriting are taught; second, a department of Economics and History covering commercial geography, business organization, commercial law, local industries, economic history and economics, civics and general political history; third, an English Department where general English literature and general English composition are taught together with special business composition including work in advertisement writing; fourth, a Department of Mathematics, where in addition to the high-school subjects of algebra, geometry and trigonometry drills in commercial arithmetic are required; fifth, the modern Language Department, giving instruction in French, German and Spanish. The purpose is to enable a student to read, write and speak easily and correctly at least two of these languages. The reading includes newspapers, market reports, business circulars and advertisements. In composition commercial correspondence is a leading feature. Finally the Science Department includes physical geography, physics, elementary chemistry and what is called vocational chemistry, a study of the application of chemistry to the special requirements of the industries of Boston.

The course is ordinarily completed in four years and somewhere during the course the boys are expected to put in part time in actual business work. For this purpose, a very complete coöperation with the business houses of Boston has been brought about; in the summer of 1909, 50 per cent of the second-year class, 77 per cent of the third-year class, and 70 per cent of the fourth-year class were provided with summer work by the business houses. Boys go into the lines which they wish to follow and to which they are recommended by the instructors. When they return to school in the fall, the statements of their summer employers are placed at the disposal of the instructors. In this way, complete record of each boy's work is kept and a close estimate of his capability is available at all times. This system of coöperation has proved very satisfactory; it provides the boys with experience and an opportunity for permanent employment and provides the business houses with the opportunity of securing the service of capable and ambitious young men.

In addition to the four-year course, a fifth year of special work is given in which a more advanced line of commercial instruction is taken up.

A valuable addition to the course has been made in the form of

traveling scholarships provided by a number of Boston business men to send two boys yearly to South America, Central America, or the West Indies, to investigate and report upon the industries of these countries. A competitive examination open to members of the graduating class is the basis of selection. The results of the trip made in 1908 fully justify the expectations of the founders of the scholarships, and the business men's committee consider it an important part of the work.

The registration in the Boston High School of Commerce has increased each year, and the nature of the work is such that the number of students returning each year is a very large percentage of the total enrolment. The work has been so successful and so satisfactory that a larger number of pupils is attracted than can be taken care of.

In addition, the Chamber of Commerce has asked that other courses for employees, especially in salesmanship, be established in the school. The employers give each employee three hours per day for twelve weeks to follow these courses.

The commercial work still continues in the other city high schools, but it should be noticed that the competition of the high school of commerce has served to stimulate the business courses of the high schools and has made them more effective.

Mr. F. V. Thompson, the head master of the Boston High School of Commerce, is convinced that this work could not be carried on by a departmental system in the regular high schools.

The Cleveland High School of Commerce

The Cleveland High School of Commerce is conducted on the same plan as that of the Boston High School of Commerce and was organized in practically the same way. The school was opened in the fall of 1909, in response to an active demand by the business men of the city of Cleveland.

An advisory committee of thirty business men not only helped in the preparation of the courses of study, but served as a committee of visitation and inspection. The course is designed to cover four years (i. e., twelve terms of three months each) and the work is divided between a number of departments.

In the English department, reading includes study of newspapers and magazine articles on commercial subjects and especially the use of trade journals. In composition the aim is efficiency for commer-

cial ends. In modern languages special attention is directed to speaking and correspondence and the attainment of a technical vocabulary. In mathematics considerable emphasis is laid on arithmetic, of course, and on practical applications of algebra and geometry. In the last term practical problems in the cost of rent, of transportation, or production and distribution, storage, shipping and advertising, etc., are given. The work in bookkeeping is very complete, including the theory and technic of bookkeeping in approved modern systems and giving special attention to banking, corporation and railroad accounting and auditing. The other departments are those of shorthand and typewriting, penmanship, commercial geography, history of commerce and American history, civics and municipal government, political economy, commercial law, physiology and hygiene, botany, chemistry and physics with especial attention to their application to commercial and manufacturing interests.

Like the Boston school, the Cleveland school maintains a commercial museum, showing the different raw materials and processes of manufacture; lectures by specialists actively engaged in the work of manufacturing and trade are given, and excursions are conducted through large manufacturing and business plants. It is expected that by coöperation with the business men of the city, arrangements for periods of actual business practice will be provided for the students who complete the courses.

In both Cleveland and Boston the teachers who are usually graduates of colleges, universities and normal schools, as well as of business colleges, have had large experience in teaching, and nearly all have had business experience, in many cases extending over a number of years. In addition several are authors of text-books on commercial subjects.

It is too early yet to report upon the results of the first year of the Cleveland school, but it confidently can be predicted that the Cleveland experience will duplicate that of Boston in its commercial high school.

Commercial courses in St. Louis high schools

St. Louis presents the most striking example of the maintenance of commercial departments in the regular high schools. Separate commercial work has been maintained since the fall of 1909. The

commercial courses are optional. Students in the two-year vocational courses may elect vocational subjects in addition to those scheduled in the first and second years of the four-year commercial course.

The vocational course, as it is called, continues for two years and at the end of that time those who complete the course are given a certificate. In 1909-10 one-third elected commercial work of one kind or another and about one-fourth elected regular vocational courses. This plan meets the demands of many students for a short business course which enables them to go early into practical work. Those who wish, however, can continue for the full four years in advanced work in subjects previously studied together with work in more advanced subjects.

The curriculum includes, of course, penmanship, commercial arithmetic, strong courses in bookkeeping, courses in commercial law and geography, and courses in stenography and typewriting in which emphasis is laid upon the necessity of time for practice.

There is no *separate* commercial department in the schools of St. Louis. There is no separate department head and no separate corps of commercial teachers, feeling the responsibility for the success of their departments. Coördination and correlation of work of the different schools is obtained through a series of committees composed of teachers from the different high schools. Each subject is in charge of the committee made up of one teacher of that subject from each high school. In charge of all of these committees is a general committee.

Since the St. Louis plan has been in use also only one year, no statement can be made as to the results. St. Louis has consciously rejected the separate commercial high-school plan and defends its action on the grounds that those who are trained in a general high school are more adaptable, and that such training avoids the "false distinctions of social and intellectual value that results from segregating pupils in separate school buildings according to the different lines of work that interest and occupy them."

They maintain that specialized training, while it makes the best piece workers, produces this specialized ability at the expense of the general ability. Moreover, it is said that the public-school system should put before the youths as nearly as possible "the many things that engage the interests and activities of men in different walks of life," and that specialized high schools give no chance for observation

or comparison in making a choice of the work to be followed in after life. The student beginning in commercial high schools and then changing his mind, finds it difficult to transfer to another high school and can not do it at all without considerable loss of credit. Transfer in a general high school from one course to another is made with a minimum amount of loss. The further claim is made that the general high school is more economical in that it is nearer to the individual's home. With a central high school of commerce all those taking commercial courses must come to one place from all parts of the city; with the other plan the student can go to the one nearest his residence.

Commercial courses in Cincinnati high schools

Cincinnati offers in 1910-11 for the first time a separate commercial course. This work was undertaken after consultation with successful business men of Cincinnati and with their hearty coöperation. The Cincinnati plan follows in general the St. Louis type except that there is a separate director of commercial work in each high school who is almost wholly independent of the regular principal. The director outlines the course of study, supervises the instruction, and teachers and students report to him. Through him the coördination of all departments is maintained and it is expected that a general director of commercial work will serve the same office for all high schools. The subjects are much the same as those in the other high schools. Cincinnati, however, like St. Louis, provides considerable practice time in stenography, typewriting and bookkeeping.

Of these four schools, the Boston school is obviously the best organized, farthest advanced, and probably the most successful. It is designed to meet the special needs of Boston, and while it is in every sense a technical school, it still attempts to provide for those who wish to continue their work in colleges. In a large commercial city like Chicago there are good reasons for establishing a separate high school of commerce and offering commercial courses also in the general high schools. The experience of Boston with this plan shows that the courses in the general high schools are much improved by the influence of the work done by the separate school, which serves as an experiment station to work out a content and method for commercial courses. The comments of business men of Chicago, given in Chapter XI, reveal a strong demand from this source for the separate school.

CHAPTER X

SOLICITATION BY PRIVATE COMMERCIAL SCHOOLS IN CHICAGO

Solicitation of pupils and parents by agents of private commercial and business schools is widespread in Chicago. It is the opinion of the writer that in this practice and its results can be found to some extent the answers to three questions which have been frequently asked:

> Why do so few pupils enter the high schools of the city?
>
> Why does such a large percentage of high-school pupils drop out early in the course?
>
> Why are the commercial schools so severely criticized by the business men of the city, in whose offices the students from these schools find employment?

The following evidence bears out the statement made above and shows that the solicitor for the business college is a serious evil in the community.

Extent of this evil

There are in Chicago forty-two or more private commercial schools or so-called "business colleges," purporting to train boys and girls of the city who wish to prepare themselves for wage-earning in clerical and office positions.

It has not been possible to obtain an authoritative statement of the attendance upon these schools. But few of the Chicago business colleges responded to the request of the United States Commissioner of Education, that they send school reports into his office. Direct requests made by the writer have received replies in only a few instances. It has been necessary, therefore, to estimate this attendance, making use of such figures as have been given and reported, and of the judgment of business college men and others who are familiar with these schools. This estimate is an attendance of at least 19,000 pupils for the last year. In the opinion of no one

who has been consulted has this number seemed too large. There is reason to believe that it is an underestimate rather than an overestimate.

What the solicitors are doing

Most of the solicitors for these schools are working on a commission basis and tend, therefore, to be more interested in securing the students than they are in telling the truth; in the amount of business they secure than in the maturity or fitness of the pupils they solicit. In very many cases the pupils, even from the fifth grade and up, are induced to leave the public schools for the purpose of taking a course in some business college. Pupils are solicited who have no adaptability for commercial training.

Many students are secured by means of what must be regarded as misrepresentation on the part of the solicitor. They promise the prospective student a job at the end of his short term of study. They draw attention to the fact that certain students have completed courses of study in a short period of time and are now holding good positions. Some of them who enroll have sufficient native ability or have received such previous training that they are enabled to complete the work in the promised time and hold a job when secured. The solicitor uses these examples as a bait to catch others who have not these qualifications. No guarantee is given that the student will be able to hold a position, and many take places only to lose them because they are incompetent.

When the standard of those who seek clerical and office work is as low as that to which our business men testify, it is not difficult to promise some sort of a place to the graduate of a six months' course. This superficial training, especially when it has been added to an incomplete elementary schooling, does not lead to later success, but condemns the boy or girl to the low wages and drudgery which are the necessary lot of the inefficient.

Thus the guarantee of a position after a short term of study in a business college becomes a source of positive injury to the children whom it attracts, and is at the same time ruining excellent material. For the same children might, after the completion of the elementary period with adequate business training, become efficient clerks and stenographers, able to gain a higher wage and take higher positions.

That such children are being solicited and enticed from the public schools in all parts of our city is a fact that is affirmed by every

public-school principal whose opinion was sought in the investigation of this problem.

Statements made by high-school teachers

A high-school teacher states:

As the most evident reason why pupils from the grammar schools go to the private business schools rather than to the public high school, may be given to the work done among grammar-school pupils of the upper grades and their parents by the solicitors of the business schools. Even without other reasons, this would be a strong force in turning the tide. In our city these business schools obtain complete lists of pupils in each of the upper grades, as well as of pupils in the high schools (one can not say how), and their solicitors canvass these families thoroughly and repeatedly, setting forth the advantages of a course in a business school, and the loss of time in attending high school. This work would not be as effective as it is were they not able to convince parents and pupils that the business college offers a short cut to wage-earning. What I have said was exemplified again to-day in the dropping out of one of my best pupils, through the persuasion of the business-school solicitor, that many of the high-school studies were time thrown away, and clinching the argument by inducing the parent to make a payment down toward the tuition, so that there should be no chance for reconsideration.

A high-school teacher of stenography says:

The business colleges are indefatigable in their efforts to secure the pupils as low down as the fourth grade; the names of pupils are obtained, the solicitor visits their homes and makes plain to the parents that it will cost no more to send a pupil to the paid business college a shorter time, than to support him in high school for a longer time, with the added benefit that he will at the end of a course in a business college be capable of holding a position, and, moreover, be placed in a position of self-support. Almost every pupil from a business college is "taken care of" in that way, no matter from what course he graduates, and irrespective of the degree of efficiency which he has attained.

Testimony from pupils in the first year of high school

No one is better able to give testimony concerning the extent and success of this solicitation than the boys and girls who have been approached by these solicitors with a view of inducing them to leave the public schools. In ten high schools located in various sections of the city, 862 pupils in the first year of the high school were asked to write a theme on "Why do not more pupils enter the high schools of our city?" The number of reasons in these themes varies from

two or three to a dozen. But it is an interesting fact that 565 of these pupils give, as a leading reason, the work of the business college agents. Quotations from a few of the themes are given below:

Another reason is because some parents think that a business college offers a child a better business education in a shorter while than high school. Perhaps parents wouldn't be so much against high school if it were not for the agents that come around and persuade many parents to let their children go to business college, because the agent claims that they thoroughly educate them and set them to work.

The business colleges of our city are trying to draw all the pupils to their schools by distributing advertisements all over the city, describing their methods of teaching and flattering their school too much.

I think the reason that more pupils do not enter high schools is that the business-college agents urge most of the grammar-school graduates to go to business college. There were about ten agents who came to my house last summer who claimed that it was foolish to spend four years of your valuable time in high school when you could learn just as much in one year in their college.

The business colleges send out agents who promise everything. If they (the children) will just go to college for six or eight months, they promise to secure them a good job. The children, being very anxious to earn money, beg and fuss until their parents finally consent to let them enter business college instead of the high school.

School pupils who have a chance to choose between high school and college are generally encouraged to attend college by men who entice them before they graduate from grammar school, so they are turned from high school. There is no one going from house to house telling of things they have in high school, and people don't bother to find out. I have had this same experience, only that my father, being a well-educated man and holding a good position, knew different, and I was compelled to go to high school.

I think one of the greatest enemies of the high schools are the agents that go around for business colleges. These men persuade the mothers of pupils to send their children to business college. They even go so far as to say that high schools are a waste of time and money. The mothers are made to have this same thought, and sign a contract before consulting any one else. This forces the pupils to go to business colleges.

In the early part of June and the latter of January, when the list of graduates from the grammar schools is known, solicitors from business colleges find out the names of the pupils and come to their house or mail a letter to coax the parents to allow their children to enter the business colleges.

Other parents are influenced by the business-college agents, who tell them how many pupils that stay at a business college a few months learn as much as a high-school graduate, and at the end of a certain time this business college will get him a good position. The parents, believing what the agents say, send their children to a business college.

Testimony from pupils in the fourth year of high school

Of 491 papers written by these pupils on the subject "Why do pupils drop out of high schools," 341 give as leading reasons the alluring advertisements of the business colleges promising a position, and the work of the solicitors of these schools.

Business colleges of to-day take away a number of the pupils of the high school. The college convinces the parents that one who has gone through their school is able to procure a larger salary than one who has gone through the high schools.

The business colleges of the city advertise widely, offering to give a person an excellent business education within three or six months, and to furnish him with a position at the end of that time. Many pupils, convinced by the agents that the education received at these colleges is as good as a full high-school course, leave the schools to avail themselves of the opportunity to be earning their own living within such a short time.

The business college is about the first to attract the pupils' attention. Sometimes before they have thought of leaving high school this institution has obtained them. This is due to the agents for these schools. Just the other day one of these agents called at our house and tried to persuade me to drop high-school work and go to the business college. In his eager desire to win pupils for his school he went so far as to run down high schools and colleges. If a person were easily persuaded they would be won. The business college usually takes the children of the more unlettered class of people away from high school.

The business colleges send inviting notices to as many addresses as they can get, telling the pupils of the wonderful advantages there are in taking a business course at once. Instead of spending four years at high school they will only have to take a few months' course in the college. This time is always made as short as possible in the letters, but one can never tell how long the course will be in reality.

When a boy or girl first graduates from grammar school, and for months before, agents of the various business colleges are constantly dinning into his ears the advantages of a business education. All through the high-school course the stream of postals and advertisements continues. Allured by the promises of bright prospects and a position guaranteed, the pupils drop out and go to business college, usually to regret it later.

What the proprietors say

We add the opinions of the proprietors of three business colleges in Chicago who either do not solicit, or condemn the practice, but still make use of it because they feel compelled to by the competition of the schools who do solicit.

One proprietor says:

Business-college training in Chicago is in large measure a failure, because of soliciting children, and employing teachers who lack training. Poor

foundation, poor teachers and text-books which produce the largest cash dividend are not conducive to efficient office help. I will welcome the day when every young man and woman who needs and wants commercial training can get it without having to pay the fee charged by special schools.

Another reputable proprietor says:

The reasons why the business colleges of our city are putting out such an immature product and foisting it upon our business men are these: Many of the proprietors care more for the dollars received as tuition than the kind of training they are giving; because of solicitation, we are getting our pupils too young and immature; the high cost of solicitation renders it impossible to provide high-class instructors.

Still another says:

We will get just as much business if we let the students alone until they are two or three years older. We would have more students if we would abolish soliciting and apply that large drain to the building up of our schools, making our rooms more attractive, securing more efficient instruction. These are the things that make any school and give it a reputable standing. I would abolish soliciting to-morrow if I could.

The cost of solicitation

We have direct testimony from four business college proprietors of the city that the various commercial schools expend from 25 to 33⅓ per cent of their gross receipts in the solicitation of their students. This draft on the income of these schools affects the quality of the teaching force and the salaries which are paid to the teachers. These facts together with the work of solicitation itself in securing immature and unfitted pupils account to a great extent for the low grade of efficiency of the average pupil who completes the courses of study, as shown by the testimony of business men of Chicago.[1]

Cost of tuition

It has been estimated on the basis of 19,000 pupils and the average cost of tuition in the commercial schools, that the citizens of Chicago pay one million four hundred and twenty-five thousand dollars ($1,425,000) every year in tuition to private business colleges, concerning the character of which they know little or nothing. This vast sum of money is given to schools which are under the jurisdiction of no educational authority. There are no restrictions concerning the capabilities of the teachers, the character of instruction,

[1] See Chapter XI.

or schoolroom sanitation. The unwholesome conditions surrounding the pupils in some of these schools warrant their inspection by the City Board of Health. They should be compelled to install proper systems of ventilation, to exercise greater care in sanitation, and to limit the number of pupils confined to each room, that the amount of breathing space may be provided which is required for the health and physical welfare of their pupils.

CHAPTER XI

ATTITUDE OF BUSINESS MEN

As a means of getting a basis for an estimate of the output of commercial educational institutions, public and private, of the city, three hundred lists of questions bearing on different phases of the subject of commercial education were mailed to leading merchants, tradesmen, employment agents of the large department stores, railroad offices and mail-order houses.

The replies to these questions contain valuable suggestions as to the quality of work done by boys and girls in offices after they have taken commercial training in business colleges and in public high schools. They indicate in a very emphatic way many defects of the present system of training, both public and private.

Below are given the seven questions, with the replies to them, together with some quotations from the letters received.

1. Do you have difficulty in obtaining efficient clerical or office employees?

86.2 per cent have difficulty in obtaining efficient employees.

11.1 per cent have no difficulty in obtaining efficient employees.

2.7 per cent have some difficulty in obtaining efficient employees.

2. (a) Do you find that the pupils who have taken commercial studies in our high schools are generally efficient as clerical or office employees?

60 per cent reply that high-school pupils are not efficient.

16⅔ per cent reply that high-school pupils are efficient.

13⅓ per cent reply that high-school pupils are fairly efficient.

10 per cent reply that they had had no experience with high-school commercial pupils.

2. (b) If not, what defects are most striking?

Generally illegible penmanship.
Deficient general education.
Lack of thorough training in English.
Poor penmanship, inability to figure easily and correctly.
Know practically nothing of accounting.

Not thorough in anything.

No foundation. Lacking in the three R's. Need special training.

Lack of thoroughness in their training in penmanship, grammar and arithmetic. There is also much to be desired in most instances in the matter of deportment.

The most noticeable defects are bad penmanship and absolute ignorance of practical business methods. Apparently the high schools pay little, if any, attention to good penmanship, although in the matter of bookkeeping, card-indexing or record-work of any description, the ability to write a neat, rapid and legible hand is a *sine qua non*. It is safe to say that at least seventy-five per cent of the students who graduate from Chicago high schools are indifferent penmen. It is also noticeable that high-school graduates apparently have little training in the practical details of such officework as a junior clerk should be familiar with, such as filing, card-indexing, operating adding machines and comptometers, billing, etc.

The very general character of the training received by pupils in commercial colleges or commercial courses in our public schools renders it difficult for the pupil to apply his knowledge in business, which in practically all lines is highly specialized.

We have tried novices both from high school and business college, but have decided that our work is important enough to pay some one else for breaking in help.

Several other features are the miserable penmanship, the lack of knowledge of mathematics, or rather lack of knowing how to apply what mathematics they have learned.

With over twenty years' actual experience in hiring pupils from the Chicago public schools, I would say that two of the greatest defects with which we have to contend in this class of employees is the miserable penmanship and lack of knowledge of ordinary arithmetic.

3. (a) Do you find that the pupils who have taken commercial branches in the private commercial colleges of our city are generally efficient?

80.6 per cent reply that these pupils are not efficient.
16.1 per cent reply that these pupils are efficient.
3.3 per cent reply that these pupils are fairly efficient.

(b) If not, what defects are most striking?

General carelessness, lack of training, lower grade of pupils.

Poor penmanship, inability to figure easily and correctly.

Poor spelling and English.

Bad penmanship, absolute ignorance of practical business methods. The ability to write a neat, rapid and legible hand is *sine qua non*.

The whole trouble with the business colleges seems to be involved in their academic and dilettante system of teaching, in which apparently not much effort has been made to grasp either the underlying principles or the

essential details of practical officework. The result is that young men come to our company feeling "cock sure" of their abilities after taking a commercial course, but in reality are densely ignorant of the most ordinary duties and routing of officework in a large corporation.

Miserable penmanship and lack of knowledge of mathematics, or rather, lack of knowing how to apply what mathematics they have learned.

The very general character and inefficiency of the training received by pupils in business colleges renders it difficult for them to apply their knowledge in business, which in practically all lines is highly specialized.

Lack of intelligence.

Poor composition and penmanship, poor training and deportment, and lack of knowledge of fundamental principles.

Lack of practical training.

You can not trust them with your correspondence because they are so poor in English.

Carelessness and inattention. A graduate of a business college told me when he had finished the course in banking that he thought he could run a bank, but I soon found that he could not balance a pass-book.

Not thorough in anything.

Insufficient instruction.

Not sufficient time given for preparation. Poor systems.

Good stenographers are in demand at high salaries, but there are too few good ones.

Deficient general education.

No speed and too mechanical.

Lack of general intelligence and mental discipline.

A great many good mechanics are spoiled in making very poor clerks.

Lacking in simple English — construction and composition — and often deceived into taking a course too early when too young and unprepared.

Very deficient, in my experience. Can not spell correctly. Have no idea of good English.

They do not think for themselves — do things too much by rote.

There is an appalling ignorance of the "three R's" when they leave school, and most commercial colleges accept them in this unprepared and incompetent condition as pupils. They emerge from these colleges as ignorant of elementary education as they went in, and with merely a cursory, and in a general way hazy, idea, of commercial business usages and customs. The average stenographer and typewriter can not produce from their badly written shorthand notes a correctly spelled or grammatical letter. As to deportment, good manners and polite addresses, these seem to be entirly forgotten and even tabooed.

4. (a) To what extent, in your judgment, would a short course of at least two years in length in the public high school giving a specialized and intensive training in commercial branches (bookkeeping, stenography, English, penmanship, etc.) help meet the demand for efficient employees in clerical and office positions?

In my opinion, such a course would be very valuable if administered under the supervision of experienced, broadgauge men of affairs, who are thoroughly familiar with modern business practice and conditions. Under these conditions the sooner the boys and girls can be started on such a course after completing their grammar-school education, the better, as it will save them from wasting their time on other high-school studies of conjectural value.

To a great extent, if general and widening knowledge can be secured in conjunction with the practical application of special knowledge.

I am convinced that thousands of children are handicapped in their start in life because their schooling is neglected in English, language and composition, including spelling, letter-writing and simple bookkeeping, and because the age for leaving school and considering their schooling finished is too young.

The course should include penmanship, arithmetic, English (including spelling and business composition, the latter of a character tending to develop individual thought and expression and not along stereotyped forms), commercial geography, particularly that of the United States, which would include the topography, geology and agriculture of the various States, as well as their boundaries, principal cities, etc., together with a study of their waterways and other means of transportation.

Commercial work has become so specialized that, in order to obtain a position at a fair rate of pay, it is necessary to handle the work from the first day of employment. A high-school graduate very rarely can write well and fast enough, and is not capable of handling figures or any class of clerical work as well as a young man who has had two years' training on that particular line of work.

This course should be provided during the first two years of high-school work, rather than in the last two, for the reason that a much smaller number of pupils could take advantage of training relegated to the last half of the four-years' course, and the ones who drop out at the end of the first two years are the ones who most need and would most benefit by such an opportunity.

Why can not there be a four-year commercial course with the work so arranged that if pupils wish at the end of two years to go to work, they will be fitted for something, and the latter part of the course so arranged that it will give a somewhat broader business preparation to those who remain?

Very much. Add to these efficient training in addition, subtraction and multiplication, with the understanding that graduates are qualified to start at the bottom only. If carefully and efficiently administered, this would be an excellent foundation for a commercial career.

It should help, provided the work were based on actual business, and under the charge of experienced, not theoretical, teachers.

4. (b) Would it be advisable to place such a course in the first two years of the high-school curriculum?

73.2 per cent think it would be advisable to place such a course in the first two years of the high-school curriculum.

26.8 per cent think it would be advisable in the last two years. The explanation of these percentages has been given under 4 (a).

5. *(a) Would your business be materially benefited if your clerical and office employees had the advantage of a broader commercial training than is offered in our public high schools or private commercial colleges?*

98 per cent reply that a broader commercial training than is offered in the public high schools or private commercial colleges would be of material benefit to business.

2 per cent reply that it would not be of material benefit to business.

(b) What suggestions would you make for such training in our public high school?

Probably 90 per cent, at least, of the product of our school system look for clerical positions first, and only go into the other lines of work when forced to do so by necessity. This would be very laudable if they were all fitted for that class of work, but as a matter of fact a great many good mechanics are spoiled in making very poor clerks. Employ teachers who are experienced men in the line of work they are teaching, and train pupils for that line of work for which they are suited.

I do not believe that a commercial course in all public high schools would prove a benefit, but would rather suggest the placing of these branches in three centrally located high schools — one on the North Side, one on the West Side and one on the South Side — where commercial branches would be taught by qualified teachers, and the course specialized by teachers who had no other duties than those of the commercial course to perform.

Would it not be advisable to institute separate classes for pupils intending to enter commercial life directly from high school along the lines as suggested in your question No. 5 (c)?

Business courses based on business method should be given by instructors who *know* business methods.

A letter filed in the wrong place or an envelope misdirected means a loss in time and money. Teach carefulness to boys. Stronger commercial courses in high schools. Public school commercial training in Chicago is a failure because it lacks *system, time, force* and *leaders.*

Broaden and intensify the course.

Emphasis on necessity of good writing, mathematics and speed. Also importance of developing reasoning faculty so that the pupil knows the *why,* with the object of acquiring ability to master new situations without help. Make minds instead of machines.

Establish a separate high school of commerce.

Would suggest a course distinctly commercial.

Pupils should be taught to think for themselves. Initiative needed. Get live, practical instructors and insist on thoroughness.

Specialized high school of commerce. Four-year course.

Church schools and private business colleges need supervision — need to be standardized. Is it not public schools that must set this standard in our city? I believe we need a State Educational Commission that is nonpartisan and undenominational, one that would be able to report on the conditions of the private and church educational institutions, and set a standard for the teachers and for the school curriculum.

5. (c) What is your opinion as to a central high school of commerce for such training, the chief idea being to train young men for competitive opportunities in business?

83⅓ per cent reply that it would be a good thing.
8⅓ per cent reply that they are doubtful as to its utility.
8⅓ per cent reply that they have no opinion.

With efficient instructors and sound organization such a school would be a great benefit.

All young men and women need it.

The commercial interests of this great city deserve such a step.

Good idea. Such a school should be kept open at night. It would be a great help to those who go to work young and fail to get the high-school work.

Good. A much-needed change.

It should also give opportunity for training young women.

It would be one of the grandest additions to education which Chicago has ever experienced. Such a high school should provide a four-year course.

There is no doubt that it would be a vast benefit to the commercial interests of Chicago. I believe, however, that in the operation of such a school the pupils' preference and adaptability should be carefully considered; that the school should be operated along the lines of "specialty," and that the pupils should be fitted for work in the particular line they are found suited for.

I am not prepared to answer this.

A central high school of commerce, if open to all grammar-school graduates, would be of great value if it could be kept free from educational fads and devoted to business methods. Such a school, to fully accomplish its purpose, should be under the control of practical men of affairs; its teachers should be men of actual business experience in their several lines, and the school should be conducted as a large business institution, with office hours, rules and general methods of procedure identical with those of any large corporation.

A fine thing, if advantages of high school and commercial college are combined, doing away with the vagueness of the one and eliminating the crudeness of the other.

It would seem to me that the central high school for pupils taking a commercial course would be a more practical way of handling the proposition than in the various high schools. If so, would it not be possible to have a night school in connection, for the benefit of young men who are employed during the day time, and possible to have the day pupils attend the night courses during certain periods and have a general exchange of ideas among the two classes of pupils?

6. Do you think that a free employment bureau, organized for the benefit of the pupils of public schools, fitted for clerical and office work, would be an advantage to business men?

84.4 per cent think that a free employment bureau would be an advantage to business men.

9.4 per cent think that it would not be of advantage to their business.

6.2 per cent say they don't know or have no opinion.

An employment bureau of the kind you suggest would be very helpful to employers, and with the pupils' daily records to refer to it should be possible for employers to get from such a bureau young men who had proved their efficiency, not by having earned a diploma, but by having earned high marks daily for promptness, courtesy, diligent attention to studies, earnestness of purpose, as well as the passing of an examination.

Yes. The pupils attaining the required degree of efficiency could be bulletined at the state employment bureaus, as well as at the various commercial and industrial clubs, so that any of the interested members could make their selections from these lists. Those interested in the welfare of the proposition could very readily tell within a short time whether the experience was an advantage or otherwise.

Many business men with whom the writer conversed said that they would be glad to utilize a number of efficient pupils during the summer vacation, while their regular employees were off on vacations, but that they had no means of finding such persons directly, or determining their standing and efficiency. The possibilities of using the suggestions herein set forth as a school incentive are worthy of careful consideration.

7. It is manifest, that to fulfill their best purposes, the commercial departments of the high schools of Chicago should keep in constant touch with the business world and advance with the evolution of mercantile development. What methods can you suggest of promoting such a relation between them and the business interests of the city?

Have practical commercial men in the directorate and as teachers — their tenure of office dependent on results.

Have the pupils, under guidance of teachers, visit large offices for study of special systems — such visits being previously arranged for.

A central high school of commerce devoted to the work and enjoying the counsel and attention of an advisory board of business men.

Arrange to have a study made once each year by heads of departments in the commercial schools, of business methods of representative business houses in Chicago.

A committee should be appointed by the educators of Chicago to meet with a committee of business men from the various branches of trade. This combined committee should investigate the needs and suggest a high-school course which will prepare young men and women to meet the demands of the commercial world.

It would seem to me that it might be possible to arrange such connection with the best high-school students in commercial courses on the one hand, and commercial houses in the city on the other, as is now in existence between certain students in the Lewis Institute with manufacturing establishments. These students spend part of their time in the school classes and part of their time in active work in the factories. In this way theory and practice go hand in hand, as they should.

Have teachers acquainted with the practical needs of business institutions; those with actual business experience which has reduced theories to actual working plans.

Lectures from practical business men would help, and also if large commercial houses could be induced to employ help from the schools for short periods of time during the rush season, allowing the pupil to return to the school when the rush is over. This would give practical experience and would enable the pupil to also obtain a little idea of what course should be followed in study.

Have representatives of high schools learn from employers of pupils reasons in each case for pupils failing to "make good." Then generalize results and correct methods in use.

If the commercial departments of the high schools of Chicago are to be kept in constant touch with the business world in order to advance with the evolution of mercantile development, one of two things would seem to be necessary: (1) Either the teachers should themselves take a post-graduate course, or make some arrangement whereby they may familiarize themselves with actual business conditions in some of our large business institutions; or (2) they should be replaced by people who have had such business experience and who are thoroughly familiar with the process of evolving competent clerical help from raw material. If the teachers in the commercial departments could attend a series of lectures, to be given by prominent business men and experts in various commercial lines, I believe such a course of lectures would be of inestimable benefit in directing the attention of these teachers to the really important and vital qualifications that should receive particular emphasis in any course of commercial instruction.

CHAPTER XII

VIEWS OF TEACHERS OF COMMERCIAL SUBJECTS IN CHICAGO HIGH SCHOOLS

[In 1910 two-year vocational courses in commercial subjects were introduced into the Chicago high schools, giving more time to practice in accounting and stenography. In most of the schools an adequate number of machines has been provided, and in so far the criticisms made in this and preceding chapters have been already met. This report was made prior to this period.]

Teachers of commercial subjects in the public high school complain that the work receives little or no encouragement from school officers, that it is lacking in equipment, in time (especially for practice work), and in an atmosphere of practical business. Moreover, pupils who elect the commercial subjects are handicapped by the excessive amount of academic work required because courses are planned to meet college-entrance requirements.

Some statements made by teachers relative to the above conditions are here given.

> Commercial education in this high school, as in the other high schools of Chicago, is in a very bad way. None of the classes provided for by the Board of Education has ever been organized except for the first year in bookkeeping and one year in stenography and typewriting. The request for classes in advanced bookkeeping and commercial law has always been denied. The number of pupils desiring advanced bookkeeping is large. We have absolutely no equipment except a limited number of typewriters. Since no instructor is available to supervise the work in the typewriting room, the result is necessarily unsatisfactory. Until commercial work receives approximately the same consideration as other subjects, it is idle to discuss courses.
>
> The trouble with the high schools, with reference to commercial studies, is that the teachers have not the responsibility for their success. Those pupils who have most of their work in this line are overworked, the others have their attention and interests divided. I think commercial work in this city will be most speedily advanced by a policy toward it similar to the policy adopted toward manual training. We should have two or three commercial high schools distributed over the city.

The enrolment in one high school shows a large decrease in the number of pupils taking commercial branches. In September, 1908,

there were enrolled in the commercial courses in this high school 310 pupils. In September, 1909, there were enrolled 252 pupils in the commercial courses. The reasons for this are given by one of the teachers in charge.

The drop in enrolment in our bookkeeping from 1908-9 to 1909-10 may be explained by the fact that in June, 1909, physiology was deducted from the time and credit allowed for first-year bookkeeping. It was thought to be more convenient to subtract this time from bookkeeping (the commercial subject) than from any other subject. The drop in stenography for the same period may be explained by the fact that sewing was offered to second-year pupils in September, 1909, as an elective alternating with stenography, and no pupil was allowed to elect both.

We have little or no equipment; lack suitable text-books; should be freed from the domination of outside (publishing) influence; and in order to invite hearty, enthusiastic, concerted effort, teachers should have a fair hearing upon matters devolving upon them to put into efficient operation. Our subjects have been looked upon as intruders within the classic precincts and have been given cold reception. We hail this movement upon the part of the business community as the dawning of a new era and the promise of better things in the future.

Our second-year bookkeeping list of pupils would doubtless have been 20 to 25 per cent larger but for difficulty arising from conflict of subjects on program schedules. This doubtless to some extent has affected the second-year stenography. Two years ago we had 40-odd applicants wanting second-year bookkeeping, but who could not be provided for because no text had then been authorized.

The departmental system (now but a name) would do much to insure thorough work. There are no heads of departments in our high schools. Such heads of departments would take pride in their own department and assist materially in securing efficient assistants fitted for such work. The work would also be better correlated.

A committee such as yours, or a committee consisting of men from business associations and men from educational associations, could propose questions of policy which would arouse an interest and impulse that would solve many difficulties.

Penmanship is taught incidentally, by taking ten minutes daily from the bookkeeping period, and only by those teachers who wish to teach it.

There ought to be a separate period given daily to penmanship, a period of fifty minutes per day devoted to penmanship alone. The course of study does not at present provide for the giving of credit for work in penmanship. This should be provided for.

What Chicago needs is a central commercial high school devoted chiefly to commercial education. Such an institution could give both the briefest and the most complete courses in the curriculum. Such an institution centrally located would so set the standards for commercial education that the other high schools of the city would be educated as to what is possible for

the city, and would be persuaded to include a larger portion of purely business education in their course of study.

The attitude of some principals and of some teachers of other subjects is that of protest or of tolerance. They insist that no commercial subject shall encroach in any way upon the time allotted to other subjects, or the interest of other subjects. Some even maintain that pupils in commercial subjects neglect other subjects, or because pupils oftener become discouraged in other subjects that the least capable pupils elect commercial subjects.

When a pupil who desires to learn typewriting may have but two practice periods (of forty minutes each) per week, how soon could one expect him to become an efficient operator? Yet his acquaintance with the machine, even under these unfavorable circumstances, the habits of close attention and concentration his practice inculcates, the improvement it develops in his formal English (spelling and punctuation especially) are all of real value to him.

Observation of the commercial work in the various high schools of the city confirms the truth of the above statements. Although 5,236 children elected commercial subjects in 1909-10 — 31.5 per cent of the total enrolment of 16,616 — the work does not receive the attention required by the interests of the pupils and the needs of the business community. Excellent equipment is provided for manual training and the science departments, but little for commercial subjects. Desks suitable for bookkeeping are found in only two or three schools. Practically all of the high schools do not have a sufficient number of typewriters, and some of these machines are in poor condition and are placed on tables not suited to the work of pupils.

CHAPTER XIII

REASONS GIVEN BY PUPILS FOR LEAVING SCHOOL

Of the 6,536 pupils who entered the Chicago high schools in September, 1905, only 1,470 were graduated four years later. This is a loss of 77.5 per cent for the four years.

Various reasons may be assigned for such a large percentage of loss. Some interesting information on this question was secured, from 491 themes written by fourth-year pupils in ten high schools of the city, on the subject, "Why Do Pupils Leave the High School?" Some of the reasons given in these themes are presented below.

The number of pupils who give as a reason "To go to business college" is 341, or 69.5 per cent. Some quotations on this point from the themes are as follows:

I think that the reason people drop out of high school is that the courses given do not thoroughly prepare them for the business life which most of them enter when they leave school. They feel that they would be better employing their time if they took a course at some business school. At the end of our high-school course can we do any one thing well? I can not. We are taught a little of everything, but not enough of any one thing to do us any good, while upon leaving a business school we would feel that we had not wasted our time and our money.

Then, again, pupils wish to obtain a business education, which is not treated thoroughly enough in the high schools. Therefore they quit to go to business college.

Third, the inability to adapt the course to their after life. The question of whether they need just the kind of education which they are receiving in the high schools or whether a course of study more adapted to their chosen vocation would not serve them a better purpose and be more lastingly beneficial to them in their struggle for a living, presents itself. The business college seems to offer a solution, therefore many students leave yearly for these institutions.

After the pupils have had some work in stenography in the high school they leave usually after the third year, to go to business college, so as to receive a good finish to the work which they expect to do in the business world.

Probably one of the most obvious reasons why many students leave high school before graduation is that those who enter for a commercial course find that the high-school course is inadequate to serve them. The commercial course in the high school does not give the student enough practice, so that

he can go out into the world and obtain a position. The business college furnishes a fuller course, and the student feels he is wasting his time in the high school when he can do a greater amount of work in less time somewhere else.

Others who are too young to go to business college or to work are sent for a year or two to high school, where they take up as much of a commercial course as they can, and then leave for a more thorough business course.

I think that if a more extensive business course was undertaken in high school there would be fewer leave-takings.

Of the many reasons for which pupils leave high school, the principal one is to obtain a business education preparatory to entering the commercial world. Since very few commercial studies are taught in the preparatory schools, those desiring to pursue a business life deem it a waste of time to spend four years in the high school when they can enter a business or commercial college and take those studies relative to their future work.

I know one boy who stopped high school because the course did not have enough studies that would be helpful to him as a business man. . . . He dropped out and immediately started to a business school, where the course pertained more to business. His parents are rather well-to-do and the young man could go to any school he wanted to. For instance, if he preferred to enter the university after high school and then enter a business college, he could do so. To sum up, I think that there should be more practical knowledge, that is, knowledge that could be helpful to the business man; and then the number of "quitters" would decrease.

Some pupils come to high school so that they may obtain better salaries when through. After having spent a year or two they find that they are not being fitted for a definite work, and leave to seek employment or enter a business college. The majority of pupils go to business college to learn commercial studies because it covers too long a space of time to study it in high school.

Many students find, during the first or second year of the course, that the studies they are pursuing do not prepare them to work or to work efficiently. It is interesting to note that 296, or 60.3 per cent, give as a reason why pupils drop out, that they see no connection between their high-school work and their future vocation. We quote here a number of statements bearing on this point:

Some pupils, after receiving a year or two of the general education afforded by the high school, leave them to prepare for some specific branch of work, for, really, the high schools do not fit the pupils for any position. These people want knowledge that they can turn into dollars and cents.

One of the reasons why some pupils do not finish the high-school courses is because they realize that the curriculum is inefficient. Since high-school pupils may be divided into two classes, those who intend to further their education by entering college and those who intend to seek employment after graduation, the curriculum should therefore provide for two separate courses.

Most high schools, however, do provide for a course which is an excellent preparation for college, but the course for those who are preparing for the business world is deficient.

The courses given at present are inadequate for a commercial life. At the end of a year a student taking the commercial course has obtained only a smattering of knowledge — many unrelated facts which are of no real value to him. He then leaves school feeling that he can gain more by practical experience.

When a high school has several different set courses, the pupil is forced to decide in the beginning which course he wishes to take up. The fact that he knows that he will be fitted for a certain calling when the course is finished furnishes an incentive to him to keep up in his work.

It has been shown that a greater per cent of manual-training pupils graduate than of those who attend any other high school. A very probable reason is that a certain course is laid out in the former school which has some definite bearing on the pupil's future work. In a carefully arranged course the pupil makes no mistake in choosing his subjects, and is encouraged by the fact that he expects to be able to do something when he is through.

The boys leave the high schools and enter the technical institutes, the manual-training schools or the business college. The girls seek the business colleges, art schools and schools of music. By beginning these studies, which will enable them to earn money during the time that they would have put in the high schools, the boys and girls of eighteen or nineteen are able to start in earning their living much sooner than if they were graduated from a public high school and after that had to prepare themselves for wage-earning. This, then, is the reason why students leave high school in the middle of the course. The course is not practical or of very much use except to those who are going on into colleges and higher schools. There is very little in the ordinary high-school course which is directly beneficial to one preparing to enter the business world. That is why classes which as freshmen number from 800 to 1,000 dwindle, till at graduation they barely touch the 100 mark.

What of the pupil who knows that at any time he may have to relinquish school for a position and, considering his assets, realizes that the algebra, science, history and possibly Latin that he has taken as requirements for his diploma will, if he drops school at the end of two years, be for all practical purposes useless in office or factory work?

To avoid this reason for dropping out, I would suggest that courses of study which qualify for some particular goal be mapped out by those competent to judge of what the goal requires, and that, omitting everything superfluous, that course, chosen by the pupil at entrance, be adhered to by compulsion throughout. Besides, a bureau of information ought to be established at the schools, of which all pupils are aware, which would aim to advise and inform students on any points in connection with the curriculum and its relation to a vocation.

PART IV

EDUCATIONAL TESTS GIVEN TO BOYS WHO HAD LEFT SCHOOL FOR WORK

By

IRWIN M. RISTINE

Special Investigator for the Sub-committee

CHAPTER XIV

PURPOSE, METHODS AND GENERAL RESULTS

The object of this investigation is to determine by specific tests the educational status of boys who leave school to go to work as soon as the law permits, regardless of their advancement in the grades.[1] Information was also gathered as to the boys' reasons for leaving school, the reasons for taking up the kind of work they were doing, the kinds of work they would like to follow for a life occupation, and the state of their intelligence on general topics.

The tests used

The character of the tests, and the best method of securing the desired information, were both difficult to determine. Several psychological tests were proposed, which it was hoped would be successful in revealing accuracy and quickness. It was soon realized, however, that the varying conditions under which these examinations would have to be made would vitiate the results along that line. Hence the psychological tests were abandoned. In the end the following plan was pursued:

(1) A question blank not dissimilar to those used by many employment offices was prepared.

(2) A minimum sixth-grade arithmetic test with special practical features was used.

(3) An English test was set in the form of a questionnaire, answers to which revealed not only the state of the boy's knowledge of the use of the language, but also to some extent his ambition and

[1] Statistics showing the number of children who leave school before graduation, and the grade reached by these children, are given in Chapter II.

his ethical conceptions. These papers were also graded for spelling and handwriting.

(4) Whenever time permitted an oral quiz was conducted, each youth being questioned for ten minutes in order to reveal his knowledge of simple matters of United States History and of Civil Government.

The method of conducting the tests

A definite period of time was allowed for each part of the examination. The whole time was a little less than two hours, and in a few cases where the employer furnished the information, rather than allow the boys to fill out our question blank, the time was still further cut down.

A regular order was followed in conducting this inquiry. The question blank was filled out first, the arithmetic was given next, then the English was given. This is mentioned because later it will be seen that a considerably larger number of boys were given the arithmetic than the English. This merely means that, in some instances, the time at our disposal was too short to examine the boys in more than one subject.

The difficulty of securing boys

So far as we knew, no such experiment as this had ever been undertaken and some method of securing the boys, whom we desired should take the tests, had to be devised. In this, much time was lost.

Boys' Clubs and Social Settlements, so far as we could learn of them, were investigated. But we found, for the most part, that the boys who were sufficiently well under control of the directors of these organizations so that they could be prevailed upon to do as they were asked in a matter of this sort, were usually under fourteen years of age and still in school. The older boys were suspicious of anything that smacked of former schooldays, and there was no way to coerce them.

The next move was to go directly to employers of boys of the type we wanted and to ask their coöperation. There was a variety of reasons why most of them did not care to have anything to do with the undertaking. Some frankly said they were not interested. Others said they could not afford to have the work of their boys interfered with long enough for the tests to be given. Other objections were made, no doubt sincere, but often trivial.

On four separate occasions boys were offered pay slightly in advance of the amount received for an equal expenditure of time in their regular employment to take the tests out of work hours. This plan was a complete failure.

One would think that the offer of extra pay, which would not have to be accounted for at home along with the rest of the weekly wage, for an hour or two of mental labor would cause the boys to yield to the wishes of the investigator. The most discouraging proof that this was not the case was furnished at one of the larger establishments, when a hundred boys on Friday, tempted by the offer of 25 cents an hour, which would assure them a chance to see the Sunday baseball game, promised to stay the following noon to take the tests before leaving for their regular Saturday afternoon holiday. The next day, however, on the blowing of the twelve o'clock whistle, all departed from the building in great haste.

Whenever the employer made the matter optional with the boys, the low-grade youth, the investigation of whose intellectual life was our distinct purpose, refused to take the tests.

Our task was made more difficult by reason of the fact that, while the labor laws require the State Factory Inspector to keep a record of those concerns that employ young people from fourteen to sixteen years of age, those above sixteen are classed as adults. It was, therefore, necessary to discover by personal investigation where boys above sixteen were to be found. Boys above sixteen were those in whom we were especially interested, as they had usually been out of school for some time.

The successful lines of approach

The boys tested were obtained as follows:

(1) By the coöperation of sympathetic employers willing to give the time of the boys and to exercise a measure of authority to get them to submit to the tests.

(2) By the courtesy of Superintendent Young we were allowed to give the tests in the sixth, seventh and eighth grades in the night schools.

(3) Superintendent Young also gave similar permission, of which we availed ourselves, in regard to the Apprentice Schools, which were in session at this time.

A word of explanation is here given. The public night schools are conducted for the benefit of those people who can not avail

themselves of the advantages of the day schools. A large number of foreigners attend to be taught the English language. Then, for the benefit of those who had to drop out of the grades of the day school in order to go to work, a regular grade system is conducted leading to common-school graduation. It was with the sixth, seventh and eighth grades of the latter class that we dealt. These grades were made up chiefly of boys between the ages of fourteen and twenty. It was an easy matter to eliminate the papers of the girls and women and the few older men before our results were made up.

The Apprentice Schools run three months in the year for the benefit of the apprentices of the Carpenters' Union of the city.

It is, therefore, seen that we found three types of boys, which groups are discriminated throughout our report: those in the night schools, those in the Apprentice Schools, and those out of school.

Method of grading

As remarked above, we did not deal with grades below the sixth in the night school, the reason being that these lower grades were made up almost entirely of people who had never had the opportunity to attend the day schools in this country, and the average age was too high for our purpose. In the sixth-grade night school we found boys who had left the fourth, fifth and sixth grades of the day school on having reached fourteen years of age. Assuming that a child should reach the eighth grade by the time that he is fourteen, these boys were all retarded when they left the day school, some more than others. These youths, who enter the sixth-grade night school in this retarded condition, are, if necessary, kept in this grade until they come up to standard. While the grading is sufficiently flexible to allow a boy who had formerly been only in the fourth-grade day school to attend the sixth-grade night school, he will not be passed on to the seventh-grade night school as soon as the boy who was in the fifth grade when he left the day school.

In the seventh and eighth grades the pupils for the most part were less retarded on leaving the day school; their average age is slightly less than the average age of the sixth grade, and the grading is a little closer in the seventh and eighth.

The young people, therefore, who are in the night schools have just the advantage implied in that fact, over those who have left the public schools altogether at a corresponding grade.

Undoubtedly, for those who have attended the night schools dili-

gently for a considerable length of time, this advantage is very great. But in the making up of these tables the advantage over the boys out of school is offset by the facts:

(a) That many of those whom we tested had just entered the night schools.

(b) That many are very irregular in attendance.

(c) Some attend merely to have a place to spend their evenings, taking very little interest in their work.

(d) The night schools run for five months in the year and, theoretically, for two hours an evening. Practically owing to late arrivals, teachers are often unable to hold classes more than one hour and a half.

(e) A room in the night schools that fails to maintain an attendance of twenty pupils is closed. Therefore, in order to keep the necessary number, a pupil may be classified above his grade. Say a seventh-grader may be called an eighth-grader. In our tables, then, he is an eighth grader, whereas, had we met the same boy out of school his name would have gone down on the tables as a seventh-grader. The number of such cases, however, is not large.

The boys in the Apprentice Schools, both by the school authorities and in our tables, are classified according to the grades they held on leaving the public day schools. Whatever training they had received in the Apprentice Schools was, as regards its effect on their standing in our tables, clear gain. However, this was less than might be supposed, for the following reasons:

(a) The schools are conducted only three months in the year.

(b) The tests were made just after the schools had commenced, so that the boys were not fresh in the work.

(c) Irregularity of attendance is even more pronounced here than in the night schools.

(d) The fact that the boys had been out of touch with schoolwork for some time before they were apprenticed had shifted the center of attention from schoolwork and rendered them careless and even resentful of it.

(e) The Apprentice Schools run three months in the winter each year for four years. Hence some of the boys had been in the school for three full winters, some for two, some for one,

and some for only a few weeks. Yet their grading as sixth, seventh and eighth grades is unaffected by this varying duration of time in the Apprentice Schools.

The boys out of school were classified according to the grade held when they left school.

The average age of the different groups:

I (night schools) seventeen years.
II (Apprentice Schools) nineteen years.
III (boys out of school) seventeen years.

In groups I and III the average age of the sixth grade was slightly greater than the average of either the seventh or eighth. This was not noted in group II.

Summary of results

Two main points stood out clearly in the arithmetic test:

First.— The boys of the eighth grade were manifestly superior to those of the seventh, as were the seventh superior to the sixth, in a test which should have been worked by all.

Second.— The boys who were in what might be termed a continuation school were ahead of the boys of the corresponding grades who were out of school.

The same conclusions held, in general, for the other tests.

The occupation tables reveal that there is a great demand on the part of a large class of our population for trade, or commercial training, which is not offered in the schools of the city. The 205 boys in Group I (boys out of school) were asked if they could have stayed in school if they had cared to do so. More than 90 per cent said they had not left school because of the necessity of going to work, but that they were tired of school. When asked if they would have stayed in school, if they could have been getting trade training, fully 75 per cent said "yes."

As a considerable number of the boys were not willing to reveal the salary they were getting, no averages are published as to the salaries of these particular boys, but the writer interviewed ten employment managers of the larger establishments in the city, and an average of their figures would place the wage of boys between fourteen and sixteen at $4.25. Inasmuch as most of these boys had carfare to pay, and bought their noon lunch, the returns to the boys' families would hardly compensate for the loss of schooling during those years, in the majority of the cases.

CHAPTER XV

THE TEST IN ARITHMETIC

The first part of the test in arithmetic is a set of four problems, which we will term the "fundamentals," taken from the list used by J. N. Rice in his extensive tests of school children, the results of which were published in the Forum, Volume 34. The first problem is of fourth-grade difficulty, the second and third should be worked in the fifth grade, the fourth because of the decimal would be classified as a sixth-grade problem. The last part of the arithmetic test is a group of four problems which might be called an exercise in objectified fractions, which teachers assure me would be easy for properly instructed fifth-grade pupils.

The arithmetic test was made uniform for all, except in the case of a few boys who had left school, below the sixth grade. They were given a somewhat easier test.

The two sets of problems given to all above the fifth grade are herewith appended.

Set I. Fundamentals

1. If a boy pays $2.83 for 100 papers, and sells them at 4 cents apiece, how much does he make?

2. A flour merchant bought 1,437 barrels of flour at $7 a barrel. He sold 900 of these barrels at $9 a barrel and the remainder at $6 a barrel. How much did he make?

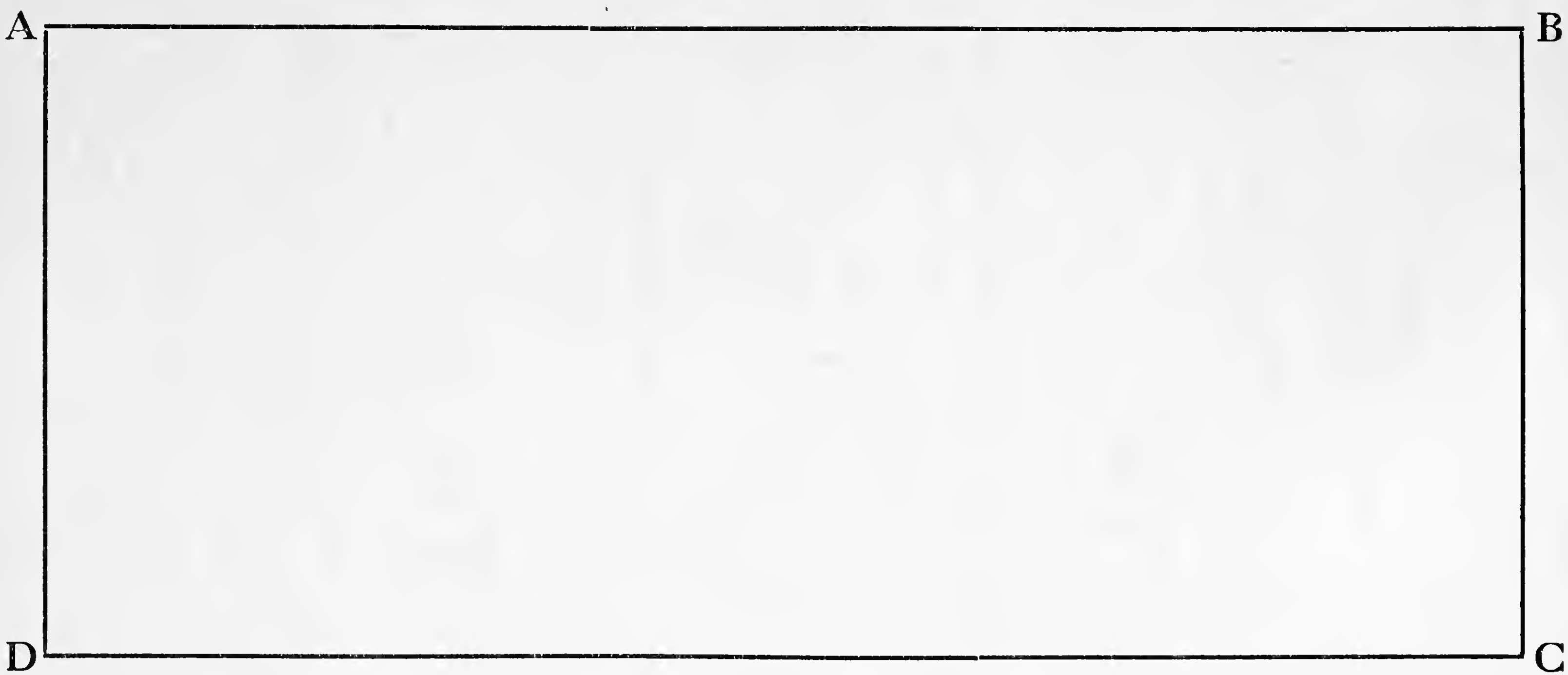
3. If a train runs 31⅔ miles an hour, how long will it take a train to run from Buffalo to Omaha, a distance of 1,045 miles?

4. A farmer's wife bought 2.75 yards of table linen at 87 cents a yard and 16 yards of flannel at 55 cents a yard. She paid in butter at 27 cents a pound. How many pounds of butter was she obliged to give?

Set II. Rectangle Test

1. On the line X Y mark off a length which is ⅓ of ½ of the whole length X Y [use a ruler].

2. On the figure A B C D mark off an *area* (surface) which is ⅓ of ½ of the whole area A B C D [use a ruler].



3. In problem 2, how many square inches are there in the area marked off?
4. How many square feet?

The first two problems involve only simple operations in the fundamental processes of multiplication, subtraction and addition. The third problem calls for knowledge of fractions and division, while the fourth contains a decimal.

The second set involves nothing but fractions put in practical form. Problems involving square root, per cent or interest, depending more or less on the memory of a rule for their solution, were intentionally left out.

It seems fair to say that this test represents the minimum amount of arithmetic that any reasonably equipped child should carry from school into life.

The method of grading was as follows:

(a) A problem solved correctly in all particulars we called — Right.

(b) Where mechanical error only occurred we graded the answer as correct in — Principle.

(c) The third ranking was — Wrong.

(d) The fourth — Not attempted.

We feel that this form shows the essential facts better than would any device for indicating percentages.

Separate tables were made for each problem showing relative standing of each grade on each of the eight problems.

The papers and tables show the following significant facts:

(a) In the three groups of boys on a test which should presumably be equally easy for all, the ranks range consistently downward for each grade from high school to sixth.

Group I (Night school)

The totals for this group (as shown in Table V) reveal that of the boys of the eighth grade 76 per cent solve correctly both as to method and mechanical execution all the problems in the test on fundamentals. In like manner, 60 per cent solve correctly all the problems in the rectangle test.

Of the seventh-grade boys of Group I 56 per cent solve the fundamental tests and 42 per cent the rectangle tests.

In the sixth grade, Group I, the percentages are 36 per cent correct for the fundamental and 34 per cent correct for the rectangle problems.

Group II (Apprentice Schools)

Table V reveals that of high-school boys (none of which grade appear in the preceding group) 96 per cent solve correctly both as to method and mechanical accuracy all the problems in the fundamental tests, 92 per cent of the rectangle tests.

For the 8th grade the percentages are 88 per cent and 86 per cent.
For the 7th grade 76 per cent and 67 per cent.
For the 6th grade 66 per cent and 31 per cent.

Group III (Boys out of school)

High school, 79 per cent on fundamentals, 86 per cent on the rectangle tests.
Eighth grade, 62 per cent and 54 per cent.
Seventh grade, 48 per cent and 23 per cent.
Sixth grade, 36 per cent and 22 per cent.

Table six shows the totals for each grade throughout the three groups.
High school — fundamentals 88 per cent, rectangle 89 per cent.
Eighth grade — fundamentals 75 per cent, rectangle 67 per cent.
Seventh grade — fundamentals 60 per cent, rectangle 42 per cent.
Sixth grade — fundamentals 46 per cent, rectangle 29 per cent.

(b) The difference in favor of the higher grades is not always in knowledge of the principles involved but in speed, accuracy and neatness — qualities that are particularly developed in the schoolroom. This is shown by the papers themselves.

When the sixth-grade boy gets the principle of his problem wrong he becomes so involved that he also fails in mechanical accuracy, while an eighth-grade boy, even if he err in the principle of his problem, will often carry it out correctly in all other respects. This fact largely accounts for the difference between the higher and lower grades in the solution of the first or easiest problem in fundamentals. This difference is:

Group I. 8th grade, 91 per cent; 7th, 77 per cent; 6th, 63 per cent.
Group II. 8th grade, 98 per cent; 7th, 97 per cent; 6th, 86 per cent.
Group III. 8th grade, 90 per cent; 7th, 87 per cent; 6th, 73 per cent.

(c) That the difference between the rankings of the grades is not merely due to a difference in degree of mechanical skill, but also involves knowledge of principles is shown by the discrepancy between the higher and lower grades in the solution of the fourth, the most difficult of the fundamental problems. The following figures reveal this:

Group I. 8th grade, 58 per cent; 7th, 32 per cent; 6th, 10 per cent.

Group II. 8th grade, 80 per cent; 7th, 61 per cent; 6th, 38 per cent.

Group III. 8th grade, 36 per cent; 7th, 19 per cent; 6th, 0 per cent.

(d) This difference extends to the ability to reason — to handle the real problems that come before men in actual life. That the boy who leaves school in the sixth grade is at a distinct disadvantage in comparison with the one who remains longer in school is shown by the totals in table six for the work on the rectangle: 8th grade, 67 per cent, 7th, 42 per cent, 6th, 29 per cent. This is more strikingly illustrated in the details found in Table V, especially in Group III.

Group I. 8th grade, 60 per cent; 7th, 42 per cent; 6th, 34 per cent.

Group II. 8th grade, 86 per cent; 7th, 67 per cent; 6th, 31 per cent.

Group III. 8th grade, 54 per cent; 7th, 23 per cent; 6th, 22 per cent.

The discrepancy between grades in ability to solve these problems is not due to a difference in age. As already noted, the average age of the boys from the sixth is somewhat greater than that of those in the grades above them. Is the lower standing of the lower grades due in part to lack of school training? Further discussion will throw light on this question.

We now undertake to prove from our tables that the discrepancy in the intellectual powers of the boy who leaves school at the sixth grade, and that of the one who remains through the seventh, eighth, or even beyond, is not merely due to selection — that is, it is not due simply to the fact that a dull boy is more likely to leave school in the lower grades than is his brighter schoolmate. The difference is due in part to the actual difference in school training. Our tables distinctly show that the boy who leaves school at the sixth grade, and

then attends the night school or the Apprentice Schools, tends to improve his intellectual powers above that of the one who remains out of school. To prove this, note the relative standing of the different grades in the three groups.

In the eighth grade, 12 per cent more boys of the Apprentice School solve the fundamentals rightly than did those of the night schools who are not getting as much drill in arithmetic. In the rectangle problems this difference is 26 per cent in favor of the apprentices. In the sixth grade the difference between Groups I and II is 30 per cent in favor of the Apprentice Schools. In the rectangle problems for some reason that is not clear the difference is the other way, 3 per cent.

The difference between the eighth grade of the night school and the eighth grade of those out of school is 14 per cent in favor of the former in the fundamentals. In the rectangle the difference is 6 per cent in favor of the night schools. In the sixth grade, between the night schools and those out of school no difference exists. In the rectangle the difference is 12 per cent in favor of the night schools.

Assuming, then, that the same type of boys quit school at a given grade, the one who attends the night school or the Apprentice Schools gains over the one who does not. Is there a natural selection here? The testimony of the teachers is to the contrary.

The tables show that even in the eighth grade a considerable number of the boys fail to solve these fifth and sixth grade problems. Other tables exist[1] which show that a larger per cent of students in the corresponding grades, who are attending day school, solve problems of equal difficulty. This would seem to show an actual total loss to the boy who leaves school before completing the eighth grade.

The arithmetic tests, Table V, reveal a marked superiority on the part of the boys of the Apprentice Schools over those of the night schools, and over those out of school, the difference often being as great as 30 per cent. This would seem to be due to the direct correlation of the work in arithmetic in the Apprentice Schools with the trade the boys are learning. In other subjects, such as English, the apprentices were by no means superior to the other boys.

[1] Below is a table showing the different grades of the Apprentice Schools, the night schools and the boys out of school, together with the per cent of the problems they worked right. Parallel with each of these is given the grade and the per cent right for a group of day-school boys who were given exactly the same test in arithmetic. The number of boys in the day schools was approximately the same as the number in the other groups. It will be noted that in the "fundamentals" the day-school boys fall below the appren-

Eighteen boys of the fifth grade, nine of the fourth and one of the third were tested. For them, the two least difficult problems that were used for the testing of the higher grade boys, and two yet more simple were used. The problems follow:

1. What will 24 quarts of cream cost at $1.20 a gallon?
2. If a boy pays $2.83 for 100 papers and sells them at 4 cents apiece, how much does he make?
3. If I buy 8 dozen pencils at 37 cents a dozen and sell them at 5 cents apiece, how much do I make?
4. A flour merchant bought 1,437 barrels of flour at $7 a barrel. He sold 800 of these barrels at $9 a barrel, and the remainder at $6 a barrel. How much did he make?

This test is certainly not more difficult than those employed for pupils of the fourth grade of the public schools. The rectangle tests were also given to these twenty-eight boys. Reference to Tables IV and IV-A will reveal the pitiful inability of a large majority of these boys to solve even the most simple of these problems.

The total number of these boys tested in arithmetic was, in fundamentals, 655, and in the rectangle 610.

tices, but in the sixth and seventh grades they are ahead in the solution of the "rectangle" problems. The eighth grade of the night schools is ahead in the "fundamentals," but in no other case. The day-school boys outrank the boys out of school straight through.

The work with the day-school pupils was done by S. J. Staples, whose results have not as yet been published.

	FUNDAMENTALS			RECTANGLE		
	Grade 8	Grade 7	Grade 6	Grade 8	Grade 7	Grade 6
	Rt. %	Rt. %	Rt. %	Rt. %	Rt. %	Rt. %
Apprentice Schools.....	88	76	66	86	62	31
Day Schools...........	66	60	44	79	63	39
Night Schools	76	56	36	60	42	34
Day Schools...........	66	60	44	79	63	39
Boys Out of School.....	62	48	36	54	23	22
Day Schools...........	66	60	44	79	63	39

Table I.— Night School

		Problem I				Problem II				Problem III				Problem IV				Total per cent	
Gr.	No.	Rt.	Per cent	Pr.	Per cent	Rt.	Per cent	Pr.	Per cent	Rt.	Per cent	Pr.	Per cent	Rt.	Per cent	Pr.	Per cent	Rt.	Pr.
8	111	101	91	2	2	87	78	15	14	84	76	10	9	64	58	13	12	76	9
7	111	86	77	3	3	71	64	17	15	57	51	12	11	38	34	16	14	56	11
6	86	54	63	......	......	35	42	6	7	23	27	11	13	16	12	4	5	36	6
Gr.	No.	W.	Per cent	N. Att.	Per cent	W.	Per cent	N. Att.	Per cent	W.	Per cent	N. Att.	Per cent	W.	Per cent	N. Att.	Per cent	W.	N. Att.
8	111	8	7	......	......	9	8	......	......	14	13	3	3	32	29	2	2	16	1
7	111	22	20	......	......	23	21	1	1	30	27	11	10	43	39	14	13	27	6
6	86	32	37	......	......	44	51	1	1	32	40	18	20	44	51	28	31	47	13

The above table shows the ranking of the night school in each of the four fundamental problems. (Set I). Reading from left to right are shown the grade, the number in the grade, the number who worked the first problem correctly, the per cent who worked the first problem correctly, the number who had the principle right, but made some mechanical error, and the per cent, and so on, for the four problems. At the end is shown the total right per cent and the total principle right per cent.

The lower half of the table shows the number who got the first problem wrong, the per cent, the number who did not attempt it, and the per cent, etc.

TABLE I-A.—NIGHT SCHOOL

		Problem I				Problem II				Problem III				Problem IV				Total per cent	
Gr.	No.	Rt.	Per cent	Pr.	Per cent	Rt.	Per cent	Pr.	Per cent	Rt.	Per cent	Pr.	Per cent	Rt.	Per cent	Pr.	Per cent	Rt.	Pr.
8	100	87	87	......	......	61	61	......	......	53	53	......	......	38	38	......	......	60	......
7	98	73	72	......	......	49	50	......	......	31	32	......	......	15	15	......	......	42	......
6	72	47	65	......	......	25	35	......	......	19	26	......	......	8	11	......	......	34	......
Gr.	No.	W.	Per cent	N. Att.	Per cent	W.	Per cent	N. Att.	Per cent	W.	Per cent	N. Att.	Per cent	W.	Per cent.	N. Att.	Per cent	W.	N. Att.
8	100	13	13	......	......	37	37	2	2	34	34	3	3	34	34	28	28	30	8
7	98	23	24	2	2	44	45	5	5	38	39	29	30	42	43	41	42	38	22
6	72	22	31	3	4	39	54	8	11	22	31	31	44	24	33	40	56	37	29

The above table is arranged in the same manner as Table I and records the results of the night school in the rectangle problems (Set II).

TABLE II.— APPRENTICE SCHOOLS

		Problem I				Problem II				Problem III				Problem IV				Total per cent	
Gr.	No.	Rt.	Per cent	Pr.	Per cent	Rt.	Per cent	Pr.	Per cent	Rt.	Per cent	Pr.	Per cent	Rt.	Per cent	Pr.	Per cent	Rt.	Pr.
H.S.	6	6	100	......	......	6	100	......	......	6	100	......	......	5	83	1	17	96	4
8	82	80	98	1	1	69	80	10	12	76	93	3	4	66	80	10	12	88	7
7	33	32	97	1	3	23	70	8	24	25	76	2	6	20	61	1	3	76	9
6	21	18	86	......	......	15	71	4	19	14	67	3	14	8	38	2	10	66	11
Gr.	No.	W.	Per cent	N. Att.	Per cent	W.	Per cent	N. Att.	Per cent	W.	Per cent	N. Att.	Per cent	W.	Per cent	N. Att.	Per cent	W.	N. Att.
H.S.	6	....	....	......	......	....	......	......	......	....	......	......	......	....	......	......	......	....	......
8	82	1	1	......	......	3	4	......	......	3	4	......	......	6	7	......	......	4	......
7	33	....	....	......	......	2	6	......	......	6	18	......	......	11	33	1	3	14	1
6	21	3	14	......	......	1	5	1	5	1	5	3	14	7	33	4	19	14	10

The results by problems for Apprentice Schools in the fundamentals (Set I).

TABLE II-A.— APPRENTICE SCHOOLS

		Problem I				Problem II				Problem III				Problem IV				Total per cent	
Gr.	No.	Rt.	Per cent	Pr.	Per cent	Rt.	Per cent	Pr.	Per cent	Rt.	Per cent	Pr.	Per cent	Rt.	Per cent	Pr.	Per cent	Rt.	Pr.
H.S.	6	6	100	......	......	6	100	......	......	5	83	......	......	5	83	......	......	92	......
8	81	78	96	......	......	74	91	......	......	66	81	......	......	61	75	......	......	86	......
7	35	27	77	......	......	26	74	......	......	22	62	......	......	12	34	......	......	62	......
6	22	14	63	......	......	9	40	......	......	4	18	......	......	1	4	......	......	31	......
Gr.	No.	W.	Per cent	N. Att.	Per cent	W.	Per cent	N. Att.	Per cent	W.	Per cent	N. Att.	Per cent	W.	Per cent	N. Att.	Per cent	W.	N. Att.
H.S.	6	....	....	......	......	....	......	......	......	1	16	......	......	1	16	......	......	8	......
8	81	1	1	3	2	5	6	2	2	12	15	3	4	16	20	4	5	11	3
7	35	3	9	5	14	5	14	4	11	8	23	5	14	18	51	5	14	26	13
6	22	6	27	2	9	10	45	3	13	14	63	4	18	15	68	6	27	51	18

Table II-A gives the results by problem for the Apprentice Schools in the rectangle test (Set II).

TABLE III.— BOYS OUT OF SCHOOL

		Problem I				Problem II				Problem III				Problem IV				Total per cent	
Gr.	No.	Rt.	Per cent	Pr.	Per cent	Rt.	Per cent	Pr.	Per cent	Rt.	Per cent	Pr.	Per cent	Rt.	Per cent	Pr.	Per cent	Rt.	Pr.
H.S.	19	18	95	......	......	16	85	3	30	16	84	......	......	10	52	2	20	79	7
8	103	96	94	......	......	67	65	18	18	54	52	9	9	37	36	16	16	62	12
7	36	33	87	......	......	17	43	7	18	14	41	3	11	8	18	4	11	48	9
6	19	14	74	......	......	9	47	3	16	4	21	......	......	......	......	......	......	36	6
Gr.	No.	W.	Per cent	N. Att.	Per cent	W.	Per cent	N. Att.	Per cent	W.	Per cent	N. Att.	Per cent	W.	Per cent	N. Att.	Per cent	W.	N. Att.
H.S.	19	1	5	......	......	......	......	......	......	3	16	......	......	7	39	......	......	15	......
8	103	3	3	1	1	17	17	1	1	35	35	5	5	46	45	3	3	25	3
7	36	3	13	......	......	12	37	......	......	14	45	5	10	23	69	1	2	41	3
6	19	3	15	1	5	6	32	1	5	11	59	4	20	17	90	2	10	49	10

Table III gives the results by problem for the boys out of school in the fundamentals (Set I).

Table III-A.—Boys Out of School

		Problem I				Problem II				Problem III				Problem IV				Total per cent	
Gr.	No.	Rt.	Per cent	Pr.	Per cent	Rt.	Per cent	Pr.	Per cent	Rt.	Per cent	Pr.	Per cent	Rt.	Per cent	Pr.	Per cent	Rt.	Pr.
H.S.	20	18	90	......	......	19	95	......	......	18	90	......	......	14	70	......	......	86	......
8	98	73	74	......	......	60	61	......	......	53	54	......	......	29	29	......	......	54	......
7	35	19	47	......	......	14	27	......	......	7	12	......	......	4	8	......	......	23	......
6	16	6	36	......	......	4	27	......	......	3	18	......	......	1	7	......	......	22	......
Gr.	No.	W.	Per cent	N. Att.	Per cent	W.	Per cent	N. Att.	Per cent	W.	Per cent	N. Att.	Per cent	W.	Per cent	N. Att.	Per cent	W.	N. Att.
H.S.	20	2	10	......	......	1	5	......	......	2	10	......	......	5	25	1	5	13	2
8	98	19	19	6	7	33	33	6	7	28	25	17	18	46	48	23	24	33	14
7	35	13	40	3	13	17	55	5	22	16	45	12	42	17	47	14	46	47	31
6	16	8	51	2	13	9	55	3	18	4	24	9	58	6	35	9	58	41	37

The results by problem for the boys out of school, rectangle test (Set II).

TABLE IV.—BOYS OUT OF SCHOOL BELOW SIXTH GRADE

		Problem I				Problem II				Problem III				Problem IV				Total per cent	
Gr.	No.	Rt.	Per cent	Pr.	Per cent	Rt.	Per cent	Pr.	Per cent	Rt.	Per cent	Pr.	Per cent	Rt.	Per cent	Pr.	Per cent	Rt.	Pr.
5	18	8	44	4	22	10	56	1	6	6	33	1	6	4	22	3	17	39	14
4	9	2	22	......	......	2	22	......	......	2	22	......	......	2	22	......	......	22	......
3	1	....	....	......	......	....	......	......	......	....	......	......	......	....	......	......	......	....	......
Gr.	No.	W.	Per cent	N. Att.	Per cent	W.	Per cent	N. Att.	Per cent	Rt.	Per cent	N. Att.	Per cent	Rt.	Per cent	N. Att.	Per cent	Rt.	N. Att.
5	18	4	22	2	11	4	22	3	17	8	44	3	17	8	44	4	22	44	17
4	9	5	56	2	22	5	56	2	22	2	22	5	56	1	11	6	67	36	44
3	1	....	....	1	100	....	......	1	100	....	......	1	100	....	......	1	100	....	100

The results by problem for the boys out of school who fell below the sixth grade in the fundamentals. Attention has already been called to the fact that this is an easier test than that given the other boys.

Table IV-A.—Boys Out of School Below Sixth Grade

		Problem I				Problem II				Problem III				Problem IV				Total per cent	
Gr.	No.	Rt.	Per cent	Pr.	Per cent	Rt.	Per cent	Pr.	Per cent	Rt.	Per cent	Pr.	Per cent	Rt.	Per cent	Pr.	Per cent	Rt.	Pr.
5	17	7	40	......	......	3	18	......	......	1	6	......	......	....	......	......	......	16	......
4	9	3	33	......	......	1	11	......	......	....	......	......	......	....	......	......	......	11	......
3	1	....	....	......	......	....	......	......	......	....	......	......	......	....	......	......	......	....	......
Gr.	No.	W.	Per cent	N.Att.	Per cent	W.	Per cent	N. Att.	Per cent	W.	Per cent	N. Att.	Per cent	W.	Per cent	N. Att.	Per cent	W.	N. Att.
5	17	7	41	3	18	9	53	5	29	5	29	11	65	6	35	11	65	40	44
4	9	6	67	......	......	2	22	6	67	1	11	8	89	....	......	1	100	25	64
3	1	....	....	1	100	....	......	1	100	....	......	1	100	....	......	1	100	....	100

The results by problem for the boys out of school below the sixth grade in the rectangle test (Set II).

TABLE V.— FUNDAMENTALS (SET I)

LOCATION	Grade	No.	Rt. Per cent	Pr. Per cent	W. Per cent	Not Att. Per cent
In the Apprentice Schools . . .	H. S.	6	96	4	....	....
	8	82	88	7	4	....
	7	33	76	9	14	1
	6	21	66	11	14	10
In the night schools........	8	111	76	9	16	1
	7	111	56	11	27	6
	6	86	36	6	47	13
Boys out of school.........	H. S.	19	79	7	15	....
	8	103	62	12	25	3
	7	36	48	9	41	3
	6	19	36	6	49	10

Table V shows the location of the boys, the grade, the number of boys, the per cent of problems worked correctly by each grade, etc., in the test on fundamentals for all three groups.

TABLE V-A.— RECTANGLE TEST (SET II)

LOCATION	Grade	No.	Rt. Per cent	Pr. Per cent	W. Per cent	Not Att. Per cent
In the Apprentice Schools . .	H. S.	6	92	....	8	....
	8	81	86	....	11	3
	7	35	62	....	26	13
	6	22	31	....	51	18
In the night schools........	8	100	60	....	30	8
	7	98	42	....	38	22
	6	72	34	....	37	29
Boys out of school.........	H. S.	20	86	....	13	2
	8	98	54	....	33	14
	7	35	23	....	47	31
	6	16	22	....	41	37

Table V-A is made up the same as Table V, but shows the grade and group standing in the rectangle test.

TABLE VI.— FUNDAMENTALS (SET I)

LOCATION	Grade	No.	Rt. Per cent	Pr. Per cent	W. Per cent	Not Att. Per cent
Apprentice Schools.........	H. S.	25	88	6	8	....
Night school..............	8	296	75	9	15	1
Boys out of school.........	7	180	60	10	27	3
	6	126	46	8	37	11

Table VI is based on Table V and shows the comparative standing of the different grades, rather than the group comparison. To illustrate, the whole number of boys of all three groups of eighth-grade standing have been added together and their averages compared with the total averages of the sixth and seventh grades.

TABLE VI-A.— RECTANGLE TEST (SET II)

LOCATION	Grade	No.	Rt. Per cent	Pr. Per cent	W. Per cent	Not Att. Per cent
Apprentice Schools.........	H. S.	26	89	....	11	1
Night school...............	8	279	67	....	25	8
Boys out of school.........	7	168	42	....	37	22
	6	110	29	....	43	28

Table VI-A is based on Table V-A, and is similar to Table VI, except that it deals with the rectangle problems while Table VI deals with the fundamentals.

CHAPTER XVI

THE TEST IN ENGLISH

The following paragraph was twice read slowly and distinctly to 89 apprentice boys, who were asked to reproduce it in their own language.

Test I

There are a great many accidents in the industrial life of to-day. Many of these accidents prove fatal. We are constructing higher buildings, cars and trains run faster, and the extensive use of machinery has greatly increased the danger. Since every year hundreds of men and women are killed or crippled, it is very important that employers guard dangerous machinery, provide fire escapes, keep the working-rooms well lighted and look after the health and safety of the workingman. On the other hand, it is extremely important that the employees learn and obey the rules which are made for their protection in factories, on trains and in other places.

The physical condition often being such as to render reading aloud undesirable, and because we hoped by the change to secure much valuable information as to the ambitions and ethical ideas of the boys, the following test was substituted which had the additional advantage of not seeming to be a set English test:

Test II

1. Why did you take up the kind of work you are now doing? Do you think it is a job in which you can advance? What makes you think so? Give your reasons fully. If you would like to do something else, tell what it is. Give your reasons fully.

2. If you were going to hire a boy to work for you, what would you want to know about him?

3. Do you think it would be right to take your own boy's wages? Why, or why not?

If you do think it is right, how long would you take his wages? Give reasons.

4. A boy said: "I know ten good men who are doctors and ten bad men who are policemen. So doctors are better men than policemen." Did he prove it? Why, or why not?

5. (a) If a man is a good batter, will he be a good base runner? Why, or why not?

(b) If all boys who are good in arithmetic are good in spelling, will all the boys who are good in spelling be good in arithmetic? Why, or why not?

Questions four and five were incorporated for the purpose of a simple test in logic. We soon discovered that the questions were beyond the capacity of the boys to answer. Hence we graded the answers to these two questions merely on their form, making note of the fact that there were a few boys who saw their logical significance.

Methods of grading English

1st Test

Reproduction of thought........................50 per cent
Form ....50 per cent

In form were included paragraphing, punctuation, capitalization, syntax and sentence structure.

The spelling and handwriting were also graded and shown in separate tables.

2d Test

General intelligence revealed in answering questions ....50 per cent
Form ....50 per cent

The results of the English test

As between grades the results shows the same condition that obtains in the arithmetic. That is, the boy who leaves school in the sixth grade is at a decided disadvantage as compared with the one who remains longer in school. This is also true in spelling and writing.

The comparison between groups can not be carried out, as the Apprentice Schools did not have the same examination that was given to the night-school boys and those out of school.

The fact that the boys out of school did better on the same English test than the night-school boys (a reversal of the arithmetic results) might be explained by the fact that the per cent of foreigners was larger in the night school.

Note should be made of the almost hopeless lack of facility of sixth-grade boys, and the few below that grade whom we tested, to express themselves in writing, even when they seemed to sense what they desired to express. They would begin sentences and not complete them, leave out predicates and, in general, reveal a complete lack of ability to express a logical sequence. To illustrate this point a few papers are here appended. The papers are in answer to the

English questions, Set II, and are copied just as they were received from the boys. The grade and age of the boy is given at the top of each paper:

Sixth Grade, age sixteen

3. No you should not take the wages of the boy becose he wonse it him selve.

I would take it as long as he wone to le me take it.

4. The boy said he nose ten good men at are doctors and ten bad men who are policemen.

5. sure if he kin run fast then he kin be a base ball paler.

houv are good in Arithmetic are good in spelling and all boys good in spelling are not good in Arithmetic.

Fifth Grade, age sixteen

Because i want it.

Yes.

Because is simply work easily and you dirty your self up.

I ask him how old he his if he would not old enough i would not hire him.

Yes.

Because if not he spent it all.

I take his wages under 19 years of age.

Because if not he be a bum if he be about 16 years of age.

Doctors are better than policeman.

Because policemen are the biggest bums out.

Fifth Grade, age fifteen

1. Because I think I can get a good out side work.

Yes I do.

Because I now other boys that done the same work.

I would like a out side job because inside dose not agree with me.

2. I would want to now if he was smart.

Fourth Grade, age sixteen

1. "I did not work i would have nothing to eat.

We do thing that a job in which you can advance what makes me thing so.

2. he is going to earn his money yeas it would be bettre

3. to take your one wages yes it is wright to take your none

4. I know if a man is a good batter will he be a good bas.

5. They will lern some trad.

Fourth Grade, age eighteen

I took this work to make a liviny.

In questions two and three which were designed to reveal the moral conceptions of the boys, the answers were rather conventional. The answers to question two (If you were going to hire a

boy to work for you what would you want to know about him?) suggested that the boys may often have filled out blanks in employment bureaus.

The answers to question three (Do you think it would be right to take your own boy's wages?) seemed more real, doubtless, because it had to do with the genuine daily experience of many of the boys. Where a boy had facility in expression the answer was often genuinely discriminative as, for instance, many said "yes" because the parents feed and clothe the boy. Some said "yes," if needed in the family, and if not needed it would yet be right to take part of the wages to be saved for the boy. They usually felt that a boy who earned should be allowed some spending money.

The following tables show the grade of advancement, the numbers, and the per cents for the different groups, also the totals for the different grades of the three groups.

AVERAGES

Table VII
Boys Out of School

Grade	No.	Per cent Eng.	Per cent Sp.	Per cent W.
H. S.	17	86	96	83
8	78	76	78	79
7	32	63	76	74
6	12	54	68	70
5	13	22	32	41

Table VIII
Night Schools

Grade	No.	Per cent Eng.	Per cent Sp.	Per cent W.
H. S.	......	......	......	......
8	85	73	87	76
7	65	61	79	73
6	47	39	62	63

Table IX
Apprentice Schools

Grade	No.	Per cent Eng.	Per cent Sp.	Per cent W.
H. S.	6	78	84	83
8	46	70	81	77
7	23	51	68	69
6	14	38	61	67

Table X
Total Average

Grade	No.	Per cent Eng.	Per cent Sp.	Per cent W.
H. S.	23	82	90	83
8	209	73	82	77
7	120	58	74	72
6	73	44	64	67
5	13	22	32	41

Tables VII, VIII and IX show the grade (Gr.), the number (No.), of boys, and the per cents in English (Eng.), spelling (Sp.), and writing (W) for the three groups. The Table X shows the average per cent of the different grades of the three groups added together.

CHAPTER XVII

THE TEST IN CIVIL GOVERNMENT AND HISTORY

One hundred and fifty-two of the boys out of school altogether were quizzed orally on questions of civil government and United States history, each boy being talked to for about ten minutes and the result noted by the questioner. In addition to these one hundred and fifty-two boys, twenty-one boys of one room of the Apprentice Schools were given a written test covering the same ground in civil government that was covered in the oral examination. As these boys had had no special drill in this subject, their marks are included in the civil government table for the other boys.

Little comment need be made as the tables speak for themselves very plainly. Very few of the boys could be termed good in this test, not many were even fair, and by far the larger per cent were marked poor or poor minus,[1] which in this table means very close to zero.

Taking the matter up from the standpoint of the grades, it may be said that the eighth-grade boy has enough knowledge of civil government so that the more important points of the subject will probably clear up in his mind as he gets a little older and reads the newspapers more. The same thing can be said for a very few of the seventh-grade boys. The information of the sixth and fifth grade boys is so meager along the lines of civil government and history that it seems doubtful whether they will ever have understanding of what democratic government is.

It was also a disappointing fact that the boys who were nearing their majority were the very poorest, as a rule, while the younger boys fresh from school were able to answer with much more facility.

A list of questions similar to those asked of the boys is here appended, and the tables then follow, showing the grade, age and rank that was given to each boy in this test.

Civil Government

Who has power to make the laws for the United States government?
What are some of the duties of the President of the United States?

[1] The grade "poor double minus" is also used, with the symbol "poor — —."

How do Congressmen obtain their office?

How are Senators elected? How many are there from each State?

What is the highest state office? Who holds that office in Illinois?

By whom are the laws of the State made?

Who is the Mayor of Chicago? What are some of the duties of the Mayor? What are the duties of the City Council?

History

Name the most important wars that have been fought in this country.

Name at least one leader on the American side in the Revolutionary War.

Name the most important leaders on both sides in the Civil War.

Who was President of the United States during the Civil War?

Who was first President of the United States?

Name the last three Presidents of the United States, including the present one.

TABLE XI.—CIVIL GOVERNMENT SUMMARY — BOYS OUT OF SCHOOL

Grade	No.	Good	Fair	Poor	Poor—	Poor — —
H. S.	19	6	9	4	....	....
8	86	4	18	29	18	17
7	43	....	1	11	14	17
6	13	....	....	2	....	11
5	10	....	....	....	....	10
4	3	....	....	....	....	3

XI-A.— Civil Government Details — Boys Out of School

H. S.	Age	H. S.	Age	H. S.	Age	H. S.	Age
Fair	16	Poor	17	Fair	17	Fair	17
Fair	16	Good	18	Good	17	Fair	16
Poor	16	Fair	17	Good	16	Fair	17
Good	17	Good	19	Fair	18	Fair	19
Poor	17	Good	19	Poor	......	......	......

8th grade	Age	8th grade	Age	8th grade	Age	8th grade	Age
Poor	17	Fair	15	Poor	18	Poor ——	17
Poor	16	Poor ——	17	Poor	17	Poor —	15
Fair	17	Poor —	20	Poor ——	17	Poor	16
Poor —	17	Poor —	16	Good	16	Poor	17
Fair	17	Poor	17	Poor ——	17	Poor ——	16
Poor —	16	Poor	15	Poor	16	Good	15
Fair	16	Poor ——	17	Poor	17	Poor	16
Poor	15	Fair	15	Poor ——	19	Good	15
Poor	16	Poor	16	Fair	16	Fair	16
Fair	16	Poor ——	17	Poor —	15	Good	16
Poor	16	Poor	18	Fair	17	Poor	18
Fair	17	Fair	17	Poor	19	Poor	17
Poor —	17	Poor	16	Poor —	16	Fair	16
Poor —	17	Poor —	17	Poor —	18	Poor —	19
Poor	19	Fair	18	Poor ——	19	Fair	16
Poor —	18	Poor	18	Fair	17	Poor	16
Poor	16	Poor —	16	Poor	18	Poor	16
Poor —	18	Poor	17	Poor	18	Poor —	16
Poor	17	Fair	14	Poor ——	15	Poor —	16
Fair	16	Poor —	15	Fair	17	Poor ——	17
Poor ——	20	Poor ——	19	Poor ——	......	Poor ——	......
Poor ——	......	Poor ——	......	......	......	......	......

7th grade	Age	7th grade	Age	7th grade	Age	7th grade	Age
Poor	17	Poor —	19	Poor ——	16	Poor ——	17
Poor ——	19	Poor ——	16	Poor	16	Fair	18
Poor	16	Poor —	16	Poor ——	18	Poor —	16
Poor ——	17	Poor —	17	Poor	19	Poor —	17
Poor	18	Poor —	17	Poor —	15	Poor ——	17
Poor —	15	Poor	19	Poor —	18	Poor ——	18
Poor	19	Poor ——	17	Poor ——	18	Poor —	16
Poor	17	Poor ——	20	Poor	20	Poor ——	20
Poor —	19	Poor —	19	Poor	......	Poor —	18
Poor	20	Poor —	18	Poor ——	......	Poor ——	......
Poor ——	......	Poor ——	......	Poor ——	......	......	......

6th grade	Age	6th grade	Age	6th grade	Age	6th grade	Age
Poor ——	17	Poor	18	Poor ——	16	Poor	17
Poor ——	......	Poor ——	16	Poor ——	17	Poor ——	17
Poor ——	16	Poor ——	16	Poor ——	15	Poor ——	19
Poor ——	20	......	......	......	......	......	......

XI-A.— Civil Government Details — Boys Out of School
Continued.

5th grade	Age	5th grade	Age	5th grade	Age	5th grade	Age
Poor — —	19	Poor — —	20	Poor — —	16	Poor — —	18
Poor — —	15	Poor — —	17	Poor — —	18	Poor — —	17
Poor — —	17	Poor — —	17	.....	.....	.....	.....

4th grade	Age	4th grade	Age	4th grade	Age	4th grade	Age
Poor — —	17	Poor — —	18	Poor — —	16	.....	.....

Table XII.— History Summary — Boys Out of School

Grade	No.	Good	Fair	Poor	Poor —	Poor — —
H. S.	18	7	9	2	.....	.....
8	79	4	33	24	11	7
7	29	.....	1	14	7	7
6	13	.....	1	1	.....	11
5	10	.....	.....	.....	.....	10
4	3	.....	.....	.....	.....	3

Table XII-A.— History Details — Boys Out of School

H. S.	Age	H. S.	Age	H. S.	Age	H. S.	Age
Good	16	Fair	17	Fair	17	Fair	17
Fair	16	Good	18	Good	17	Fair	16
Poor	16	Fair	17	Good	16	Fair	17
Good	17	Good	19	Fair	18	Fair	19
Poor	17	Good	19	.....	.....	.....	.....

8th grade	Age	8th grade	Age	8th grade	Age	8th grade	Age
Poor	17	Fair	15	Poor	18	Fair	17
Fair	16	Poor — —	17	Poor	17	Poor	15
Fair	17	Poor —	20	Poor —	17	Fair	16
Poor —	17	Poor —	16	Good	16	Poor	17
Fair	17	Fair	17	Poor	17	Poor	16
Poor	16	Poor	15	Poor	16	Good	15
Fair	16	Poor	17	Fair	17	Fair	16
Poor	15	Fair	15	Poor	19	Good	15
Poor	16	Poor	16	Fair	16	Fair	16
Fair	16	Fair	17	Poor —	15	Good	16
Poor	16	Poor	18	Fair	17	Fair	18
Fair	17	Fair	17	Poor	19	Fair	17
Poor	17	Poor	16	Poor	16	Fair	16
Poor —	17	Poor	17	Poor —	18	Poor —	19
Fair	19	Fair	18	Poor — —	19	Fair	16
Poor —	18	Poor	16	Fair	17	Fair	16
Poor	16	Poor	16	Fair	18	Poor	16
Fair	18	Poor	17	Poor	18	Poor — —	16
Fair	17	Fair	14	Fair	15	Poor	16
Fair	16	Poor —	15	Fair	17	.....	.....

TABLE XII-A.— HISTORY DETAILS — BOYS OUT OF SCHOOL

Continued.

7th grade	Age	7th grade	Age	7th grade	Age	7th grade	Age
Poor.......	17	Poor —....	19	Poor — —..	16	Poor — —..	17
Poor — —...	19	Poor — —..	16	Poor......	16	Fair.......	18
Poor.......	16	Poor —....	16	Poor — —..	18	Poor —....	16
Poor — —...	17	Poor —....	17	Poor......	19	Poor —....	17
Poor.......	18	Poor......	17	Poor......	15	Poor — —..	17
Poor —.....	15	Poor......	19	Poor......	18	Poor —....	18
Poor.......	19	Poor......	17	Poor......	18	Poor......	16
Poor.......	17	....	......	....	......	....	.....

6th grade	Age	6th grade	Age	6th grade	Age	6th grade	Age
Poor — —...	17	Fair.......	18	Poor — —..	16	Poor......	17
Poor — —...	......	Poor — —..	16	Poor — —..	17	Poor — —..	17
Poor — —...	16	Poor — —..	16	Poor — —..	15	Poor — —..	19
Poor — —...	20	....	......	....	......	....	.....

5th grade	Age	5th grade	Age	5th grade	Age	5th grade	Age
Poor — —...	19	Poor — —..	20	Poor — —..	16	Poor — —..	18
Poor — —...	15	Poor — —..	17	Poor — —..	18	Poor — —..	17
Poor — —...	17	Poor — —..	17	....	......	....	.....

4th grade	Age	4th grade	Age	4th grade	Age	4th grade	Age
Poor — —...	17	Poor — —..	18	Poor — —..	16	....	.....

CHAPTER XVIII

PRESENT AND DESIRED OCCUPATIONS

From the question blank which was given the boys to fill out we were able to learn their present occupations, and the answer to question one of our English test revealed what the boys would like to do in the future.

The first series of tables (XIII and XIII-A) that follows set forth the desired occupation of 350 boys, and parallel with this are columns showing the age and present employment of the same boys.

Out of the 350 cases there were 117 who expressed themselves as satisfied with their present employment. A further analysis shows that 42 of the 117 either have trades or are apprentices learning trades.

There were 19 out of the 350 who expressed themselves as being dissatisfied with what they were doing, but who did not state what they wanted to do. Only two of these had trades.

There were nine who have trades that did not give promise of being very profitable, and they desired to change to other trades.

Adding those who have trades, or are apprentices, to those who are not learning trades, but would like to, we have 170 out of the 350 cases, or 49 per cent. There are 35 more who wish to get into officework, or business. This makes 11 per cent. Thus, 60 per cent of the boys want trade or business training. It is the writer's belief, also, that a considerable number of the boys who stated that they were satisfied did so merely because they were just out of school and had not given much thought to what they would like to do ultimately. A year or two later they would swell the per cent of those who desire to get into the trades, or business.

The next table (XIV) shows what a number of boys are doing, but fails to reveal what they might desire to do. This was because they were given the information blank to fill out, but were not given the English test because of lack of time, which was explained earlier in the paper.

Following this is a short table (XV) of boys who apparently through inability failed to fill out the information blank or answer

our English questions so that we could tell what they were doing, or what they desired to do. These, for the most part, were of the sixth grade.

The last table (XVI) is based on those preceding and shows the kinds of work which the boys mentioned, and the number of boys which desired each kind of work.

Table XIII.— 8th Grade Night School

Desired employment	Age	Present employment
Satisfied	17	Hardware store
Satisfied	17	Errands
Satisfied	15	Errands
Satisfied	17	Clerk, office
Satisfied	18	Bookbinding
Satisfied	22	Elevator operator
Satisfied	16	Door boy.
Satisfied	17	Entry clerk
Satisfied	16	Music store clerk
Satisfied	16	Stock boy
Satisfied	15	Shipping clerk
Satisfied	20	Pressman-printer
Satisfied	16	Office
Satisfied	16	Tailor
Satisfied	19	Patternmaker's apprentice
Satisfied	16	....
Satisfied	17	Jeweler
Satisfied	16	Pressman-printer
Satisfied	21	Printer
Satisfied	16	Printer
Satisfied	15	Errands
Satisfied	15	Music store clerk
Satisfied	15	Office
Satisfied	16	Machine shop
Satisfied	16	Office
Satisfied	16	Office
Satisfied	17	Printer
Satisfied	18	Special messenger post office
Satisfied	15	Postal service
Satisfied	21	Telegraph operator
Dissatisfied	20	Clerk
Dissatisfied	16	Interpreter and translator
Dissatisfied	16	Errands
Dissatisfied	22	Plumber
Dissatisfied	16	Office
Dissatisfied	16	Office
Traveling salesman	20	Clerk
Street car conductor	22	Veneer cutter
Theater decorator	18	Painter and decorator
Boat builder	18	Painter
Engraver	16	Office
Undetermined	15	Office boy
Undetermined	15	Errands
Undetermined	16	Office

Table XIII.— 8th Grade Night School

Continued.

Desired employment	Age	Present employment
Business	20	Stenographer
Business	18	Shipping clerk
Trade	19	Filing clerk
Trade	16	Machine shop
Trade	18	Page, Library
Machinist	16	Engraver
Machinist	17	Office
Electrician	16	Machine shop
Electrician	17	Office
Electrical Engineer	16	Office
Typewriter repairer	16	Typewriter deliverer
Bank	18	Filing clerk
Draughtsman	16	Window-shade maker
Insurance	15	Office boy
Bookkeeper	15	Bagmaker
Bookkeeper	21	Electrician
Architect	16	Office
Architect	19	Student
Letter carrier	17	Special delivery messenger P. O.
Letter carrier	20	Shipping clerk
Special delivery P. O	18	Box factory
Pharmacist	20	Cigarmaker
Pharmacist	18	Wire-frame maker
Railroad office	16	Office
Chemist	16	Messenger
Automobile machinist	17	Stock boy
Office	18	Express driver
Office	18	Furniture packer
Office	15	Factory
Government office	20	Printer
Railroad mail clerk	24	Painter
Grain buyer	19	Cloth roller
Chauffeur	18	Packer
Telegraph operator	16	Office
Telegraph operator	18	Office
Railroad engineer	17	Office
Clerk	16	Order department
Farmer	22	House work
Farmer	20	Order clerk

7th Grade Night School

Desired employment	Age	Present employment
Satisfied	17	Register's clerk
Satisfied	20	Machine shop
Satisfied	18	Sign lettering
Satisfied	14	Jewelry delivery
Satisfied	22	Shipping clerk
Satisfied	16	Driver
Satisfied	17	Furniture finisher
Satisfied	19	Clerk

7TH GRADE NIGHT SCHOOL

Continued.

Desired employment	Age	Present employment
Satisfied	15	Office
Satisfied	19	Printer
Satisfied	......	Printer
Satisfied	16	Pharmacist's apprentice
Satisfied	18	Filing clerk
Satisfied	17	Photographer
Satisfied	17	Errands
Satisfied	18	Sheet-metal worker
Satisfied	16	Errands
Satisfied	18	......
Satisfied	15	Grocer clerk
Satisfied	20	Printer
Satisfied	18	Shipping clerk
Satisfied	21	Electrotype
Satisfied	15	Engraver
Satisfied	16	Patternmaker apprentice
Satisfied	21	Clerk, office
Satisfied	17	Trimmer
Satisfied	17	Trimmer
Satisfied	16	Office
Dissatisfied	19	Filing clerk
Dissatisfied	17	Stock keeper
Dissatisfied	15	Office
Undetermined	15	Errands
Undetermined	22	Floor walker
Undetermined	16	Butcher's clerk
Undetermined	21	Clerk
Undetermined	16	Machine shop
Business	17	Telegraph operator
Business	17	Clerk
Trade	18	Filing orders
Trade	18	Machine shop
Trade	16	Stock keeper
Machinist	17	Wiring operator
Machinist	16	......
Machinist	16	Printer
Machinist	14	Messenger
Electrician	19	Transfer checker
Electrician	16	Office
Letter carrier	22	Freight hand
Draughtsman	18	Apprentice
Office, railroad	20	Office
Civil engineer	17	Jewelry deliverer
Piano tuner	18	Final inspector of pianos
Farmer	17	Butcher
Railroad engineer	18	Office
Architect	17	Architect's office
Navy	16	Office
Printer	15	Messenger
Tinsmith	15	Wrapper
Stenographer	21	Claim adjuster
Traveling salesman	22	Stock keeper
Clerk	20	Unemployed
Structural engineer	......	......

6th Grade Night School

Desired employment	Age	Present employment
Satisfied	17	Stockkeeper
Satisfied	16	Signpainter
Satisfied	16	Chauffeur
Satisfied	15	Office
Satisfied	18	Steamfitter's apprentice
Satisfied	....	Printer's apprentice
Satisfied	21	Candymaker
Satisfied	22	Carriagemaker
Satisfied	24	Carpenter
Satisfied	16	Presser, tailor
Satisfied	16	Special delivery messenger
Satisfied	....	Contractor's assistant
Dissatisfied	16	Driver
Dissatisfied	....	Cigarmaker
Dissatisfied	....	Bottle washer
Dissatisfied	....	Paper box factory
Dissatisfied	15	Tailor's shop boy
Undetermined	20	Fireman
Undetermined	15	Messenger
Undetermined	20	Driver
Undetermined	20	Fur operator
Undetermined	....	Wrapper
Undetermined	....	Milk business
Undetermined	....	Machine shop
Trade	15	Office
Trade	....	Machine shop
Trade	16	Errands
Trade	16	Errands
Electrician	17	Elevator operator
Plumber	17	Wrapper
Typewriter	18	Gold burnisher
Office	15	Buttonmaker
Office	16	Wrapper
Office	20	Cigarmaker
Telegraph operator	15	Office
Machinist	....	Bottle washer
Machinist	15	Office
Carpenter	20	Wrapper
Printer	15	Errands

TABLE XIII-A.— HIGH-SCHOOL BOYS OUT OF SCHOOL

Desired employment	Age	Present employment
Satisfied	18	Machinist's helper
Satisfied	17	Telephone inspector
Satisfied	17	Tube boy
Satisfied	17	Order picker
Satisfied	15	Messenger
Satisfied	19	Record clerk
Satisfied	18	Order clerk
Satisfied	16	Office
Satisfied	15	Errands
Satisfied	17	Pricer
Dissatisfied	19	Foundry
Trade	17	Carrier
Draughtsman	17	Machine shop
Mechanical engineer	19	Machine shop
Lineman	17	Lineman's helper
Electrician	16	Office
Lawyer	19	Lineman's helper
Pharmacist	16	Office

8TH GRADE BOYS OUT OF SCHOOL

Desired employment	Age	Present employment
Satisfied	16	Office
Satisfied	15	Office
Satisfied	17	Machinist's helper
Satisfied	17	Lineman's helper
Satisfied	16	Telephone office
Satisfied	18	Telephone office
Satisfied	19	Chauffeur
Satisfied	17	Stenographer
Satisfied	16	Messenger
Satisfied	16	Order filler
Satisfied	15	Messenger
Satisfied	15	Messenger
Satisfied	15	Errands
Satisfied	17	Wrapper
Satisfied	17	Order picker
Satisfied	17	Tube boy
Satisfied	17	Packer
Satisfied	16	Messenger
Satisfied	15	Office boy
Satisfied	16	Tube boy
Satisfied	17	Order picker
Satisfied	17	Telegraph operator
Business	17	Office
Business	15	Messenger
Business	16	Messenger
Business	15	Messenger
Business	15	Messenger
Business	20	Re-checker
Business	16	Errands

8th Grade Boys Out of School

Continued.

Desired employment	Age	Present employment
Business	16	Errands
Trade	17	Machine shop
Trade	16	Machine shop
Trade	17	Machine shop
Trade	14	Office
Trade	16	Telephone office
Trade	16	Lineman's helper
Trade	15	Messenger
Trade	18	Order filler
Trade	17	Order filler
Trade	16	Order filler
Trade	16	Order filler
Trade	16	Wrapper
Trade	16	Errands
Trade	15	Errands
Musician	17	Order picker
Machinist	19	Machine shop
Electrician	17	Office
Electrician	16	Lineman's helper
Electrician	18	Telephone office
Electrician	18	Machine shop
Electrician	16	Lineman's helper
Electrician	15	Messenger
Electrician	16	Messenger
Electrician	17	Messenger
Patternmaker	17	Machine shop
Patternmaker	17	Machine shop
Steamfitter	16	Machine shop
Steamfitter	18	Telephone office
Wrought shop	18	Machine shop
Real estate	18	Office
Electrical engineer	16	Lineman's helper
Lineman	18	Telephone office
Lineman	18	Machine shop
Bank	15	Telephone office
Bookkeeper	16	Telephone office
Letter carrier	18	Office
Plumber	16	Telephone office
Plumber	15	Messenger
Plumber	16	Office
Draughtsman	16	Lineman's helper
Law	16	Carrier
Office, business	15	Messenger
Correspondence, M. O. house	15	Messenger
Pharmacist	17	Packer
Lathing Contractor (F. A. T.)	16	Errands
Carpenter	17	Supply clerk
Bookbinder (T. T.)	16	Messenger
Commercial school	18	Order clerk
Dissatisfied	17	Errands
Dissatisfied	17	Delivery boy
Undetermined	19	Machine shop
Undetermined	16	Office boy

7th Grade Boys Out of School

Desired employment	Age	Present employment
Satisfied	18	Office
Satisfied	17	Machine apprentice
Satisfied	16	Machine shop
Satisfied	15	Telegraph office
Satisfied	17	Electrician's helper
Satisfied	16	Lineman's helper
Satisfied	16	Lineman's helper
Satisfied	17	Lineman's helper
Satisfied	19	Lineman's helper
Satisfied	16	Office
Satisfied	17	Order picker
Satisfied	16	Engraver
Satisfied	16	Order filler
Satisfied	19	Packer
Dissatisfied	17	Messenger
Dissatisfied	18	Machine shop
Business	16	Messenger
Trade	17	Machine shop
Trade	15	Office
Trade	16	Telephone office
Trade	17	Machine shop
Trade	16	Machine shop
Trade	17	Carrier
Trade	18	Order filler
Trade	17	Order filler
Electrician	16	Office
Electrician	19	Machine shop
Electrician	17	Order picker
Electrician	19	Machine shop
Lineman	18	Office
Lineman	18	Telephone material clerk
Printer	18	Machine shop
Draughtsman	16	Office
Draughtsman	17	Machine shop
Bookkeeper	16	Office

6th Grade Boys Out of School

Desired employment	Age	Present employment
Satisfied	16	Office
Satisfied	16	Errands
Satisfied	17	Order filler
Dissatisfied	15	Office boy
Business	17	Packer
Business	16	Errands
Trade	18	Wrapper
Trade	17	Order filler
Office	15	Messenger
Electrician	20	Machine shop
Civil engineer	19	Machine shop
Printer	17	Wrapper
Carpenter	16	Order filler

5TH GRADE BOYS OUT OF SCHOOL

Desired employment	Age	Present employment
Undetermined	17	Foundry
Undetermined	18	Carrier
Undetermined	18	Machine shop
Undetermined	16	Machine shop
Undetermined	17	Machine shop
Undetermined	17	Machine shop
Undetermined	18	Machine shop
Undetermined	20	Machine shop
Undetermined	16	Machine shop
Undetermined	20	Machine shop
Trade	17	Machine shop
Trade	17	Machine shop
Trade	16	Machine shop
Machinist	17	Machine shop
Butcher	17	Machine shop
Butcher	18	Machine shop

TABLE XIV.— 8TH GRADE NIGHT SCHOOL

Present employment	Age	Present employment	Age
Machinist	20	Machine shop	16
Office boy	15	Office clerk	18
Bricklayer's apprentice	19	Errand boy	15
Designer's apprentice		Carpenter's apprentice	19
Clerk	19	Carpenter	19
Carpenter	19	Carpenter	18
Usher	19	Errand boy	17
Order clerk	17	Office clerk	16
Teaming	16	Machinist's apprentice	19
Carpenter's apprentice	21	Making telephone condensers	18
Filling telephone boxes	20	Baggage checker	18
Painter and decorator	19	Packer (provisions)	16

7th Grade Night School

Present employment	Age	Present employment	Age
Office boy	15	Machine shop	18
Painter's helper	15	Machine shop	16
Office boy	15	Elevator operator	23
Piece work	17	Delivery boy	20
Office boy	17	Machinist	......
Machinist	23	Lumber tallier	24
Truck handler	24	Lather	21
Photographer's helper	15	Office boy	15
Cutter-tailor	......	Office boy	......
Printer	18	Office boy	16
Office boy	15	Baker	19
Tagging	18	Stock boy	16
Varnisher	......	Blacksmith's helper	16
Office boy	15	Janitor	17
Mail clerk, assistant	17	Office boy	15
Bill distributor	18	Tailor's apprentice	14
Printer	15	Office boy	15
Bill distributor		Wood worker	21
Office boy	16	Helper, awning shop	19
Office boy	16	Order filler	16
Office boy	16	Office boy	15
Packer	16	Errand	16
Office boy	16	Office boy	15
Errand	17		

6th Grade Night School

Present employment	Age	Present employment	Age
Errand	......	Elevator operator	18
Tailor shop	......	Machine oiler	22
Order clerk	20	Tailor	20
Stock boy	18	Butcher	......
Bricklayer	20	Electric light trimmer	24
Errands	15	Candymaker	17
Switch tender, railroad	20	Stairbuilder	23
Carpenter	20	Carpenter	18
Bricklayer's apprentice	17	Errand	18
Jewelry packer	19	Office boy	15
Candymaker	20	Machine shop	19
Machine shop	17	Drug store	18
Shipping clerk		Bricklayer's apprentice	17
Clerk, dry goods	20	Tailor's shop	16
Clerk	17		

Table XV.— 6th Grade Night School

Present employment	Age	Future
Failed to reveal.................	18	Undetermined
Failed to reveal.................	....	Undetermined
Failed to reveal.................	....	Undetermined
Failed to reveal.................	....	Undetermined
Failed to reveal.................	....	Undetermined
Failed to reveal.................	17	Undetermined
Failed to reveal.................	....	Undetermined
Failed to reveal.................	14	Undetermined
Failed to reveal.................	....	Undetermined
Failed to reveal.................	18	Undetermined
Failed to reveal.................	....	Undetermined
Failed to reveal.................	....	Undetermined
Failed to reveal.................	....	Undetermined
Failed to reveal.................	14	Undetermined
Failed to reveal.................	....	Undetermined

7th Grade Night School

Failed to reveal.................	20	Undetermined
Failed to reveal.................	....	Undetermined
Failed to reveal.................	18	Undetermined
Failed to reveal.................	....	Undetermined

8th Grade Night School

Failed to reveal.................	20	Undetermined

TABLE XVI.— DESIRED EMPLOYMENT

	No.		No.
Satisfied	117	Electrical engineer	2
Dissatisfied	19	Typewriter repairer	1
Undetermined	26	Bank	2
Trade	35	Insurance	1
Electrician	16	Bookkeeper	4
Plumber	4	Special delivery P. O	1
Office	7	Pharmacist	4
Telegraph operator	3	Railroad office	2
Business	14	Chemist	1
Machinist	10	Automobile machinist	1
Carpenter	3	Government office	1
Printer	4	Railroad mail clerk	1
Draughtsman	6	Grain buyer	1
Letter carrier	4	Chauffeur	1
Civil engineer	2	Butcher	1
Piano tuner	1	Lineman	5
Farmer	3	Mechanical engineer	1
Railroad engineer	2	Lawyer	2
Architect	3	Musician	1
Navy	1	Patternmaker	2
Tinsmith	1	Steamfitter	2
Stenographer	2	Real estate agent	1
Traveling salesman	2	Layerout in wrought shop	1
Clerk	2	Correspondence, M. O. house	1
Street-car conductor	1	Lathing contractor	1
Theater decorator	1	Bookbinder	1
Boatbuilder	1	Commercial school	1
Engraver	1	Structural engineer	1